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Chapter 1
Introduction

Multi-Lingual/400 is a powerful utility. It is designed to allow you to concentrate on the information you need and to share this information with others. The AS/400 was designed for use in more than one language format and *now* with the aid of Multi-Lingual/400 you will be able to utilize its full potential.

Think of the Multi-Lingual/400 as a passport for your AS/400, it converts source code to use any IBM supported language. Multi-Lingual/400 will also standardize constants and literals within your business applications. You will now be able to display screens in the format you select and generate reports in the language of your choice.

Before You Begin

Multi-Lingual/400 is for anyone wanting to utilize their AS/400 multi-lingual capabilities. Before you install and set up Multi-Lingual/400 you need to:

- Determine who will be doing the installation and conversion of files. (*Multi-Lingual/400 recommends this be done by a programmer.)*
- Determine when the installation and conversion will take place. Although installation is relatively easy and does not interfere with normal operating procedures, the conversion of source code can be somewhat time consuming. (*Multi-Lingual/400 recommends doing the conversion when the system will not be in use.)*
- Select a language translator that will convert the language dictionary to the language of your choice. You may wish to use someone within your company to maintain and validate this dictionary or purchase a translation software tool.

- The Multi-Lingual/400 Utility license may be a temporary license for twenty days only. To extended the license key contact your Multi-Lingual/400 Sales Representative. *(Five days before expiration of the temporary license and every subsequent day until expiration you will receive a reminder at start-up, reminding you your temporary license is about to expire.)*

- Five megabytes of AS/400 storage is required.

Chapter 2
Installation

Chapter two describes the installation procedures used to install Multi-Lingual/400. The initial Multi-Lingual/400 installation is simple, but does require some basic understanding of programming commands.

Step 1: Sign on to the AS/400.

Sign on to the AS/400 with a user profile of QPGMR Group Authority.

Step 2: Create a Multi-Lingual/400 library.

Create a library on the AS/400 to hold the Multi-Lingual/400 object code using the following Create Library (CRTLIB) command:

CRTLIB LIB(ML400) TEXT('Multilingual/400') LIB TYPE(*PROD)

Step 3: Load Multi-Lingual/400 Object Code.

Load the media containing the object code into the appropriate device. The Multi-Lingual/400 Object Code will be loaded into the ML400 library. Restore the object code to the previously created object code library, using the following Restore Object (RSTOBJ) command:

RSTOBJ OBJ(*ALL) SAVLIB(ML400) DEV(DEVICE NAME)
VOL(*MOUNTED) RSTLIB(ML400) OUTPUT(*PRINT)

NOTE: The Output is set to PRINT, to provide the user with object documentation and in most cases the device name will be TAP01.

NOTE: Messages about security or data format changes are normal. The messages concerning the number of objects restored will follow.

Step 4: Review the output.

Verify that all objects have been restored, then enter the following command:

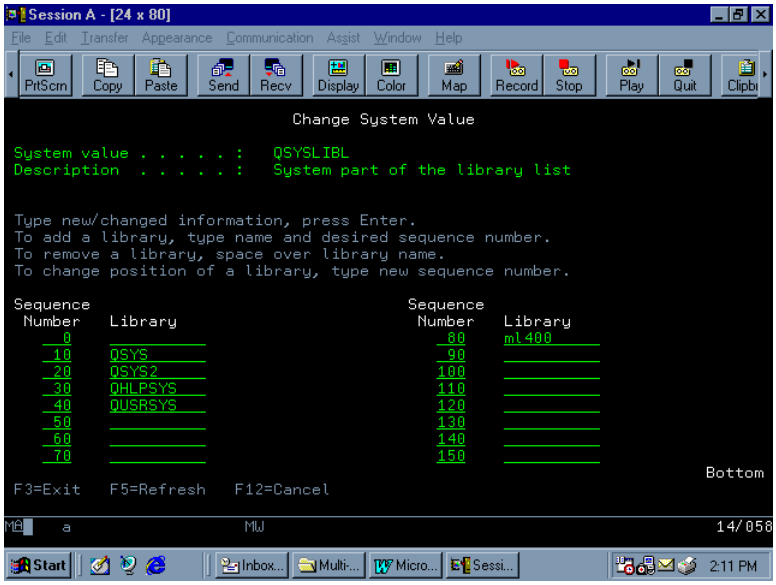
SIGNOFF

Step 5: Sign on to the AS/400 as QSECOFR.

Enter the following command to add ML400 to the end of the system library list:

WRKSYSVAL SYSVAL(QSYSLIBL)

NOTE: ML400 should be added last in the system library list.



Step 6: Signoff

Step 7: Sign on to the AS/400 using a profile with QPGMR Group Authority.

On the command line enter the following:

DSPLIBL

The Display Library List provides the names, types, and text of the libraries in the user's library list. Verify that the ML400 library has been added to the systems part of the library list.

Step 8: Start the Trigger Program for the Dictionary Physical File.

On the command line enter:

CALL CTNLSSTART

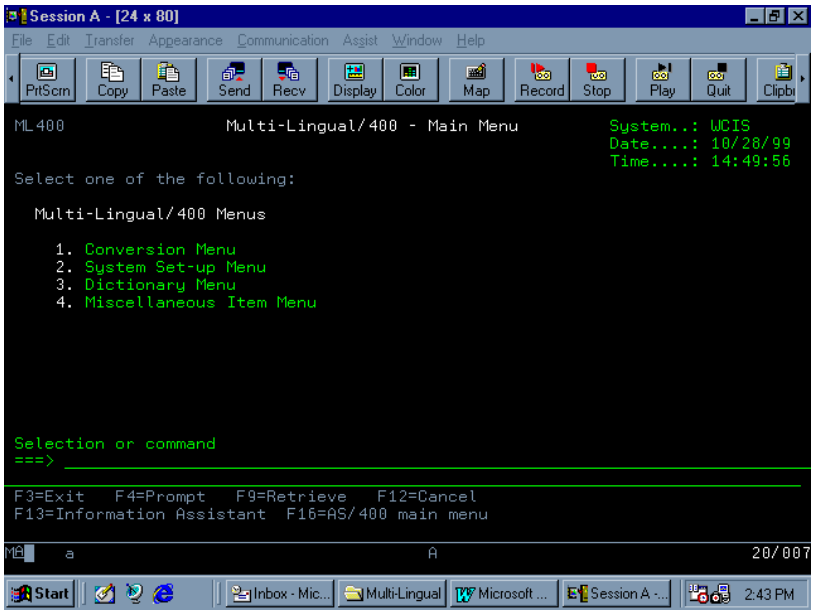
NOTE: This program will be used during installation only. This program will create the triggers for the dictionary file (FTLNGMST).

Step 9: View Multi-Lingual/400 Main Menu.

On the command line enter the following command:

GO ML400

NOTE: This step has completed the installation of Multi-Lingual /400, the following screen will be displayed:



Step 10: Signoff.

The Multi-Lingual/400 installation is complete.

Chapter 3
Creating User Defined Options

Chapter three will discuss creating the Multi-Lingual/400 commands used to convert all files. It is not necessary to create the commands, but it does aide in the converting process.

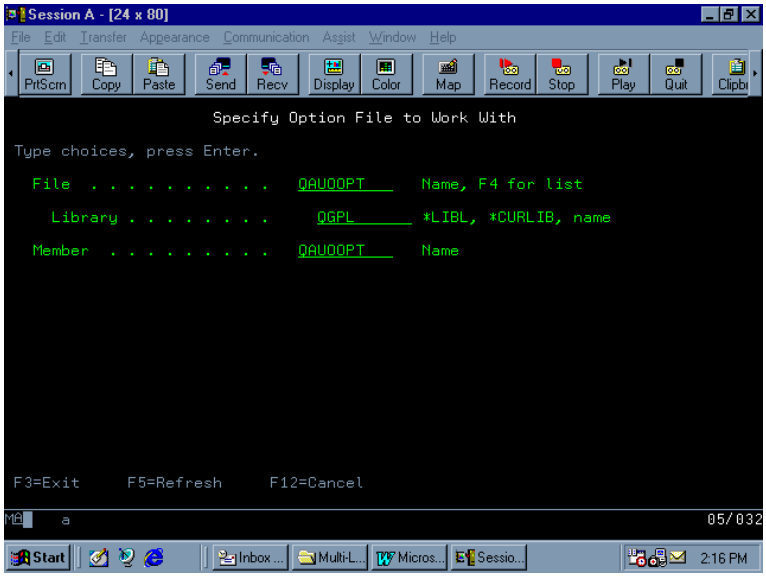
Step 1: Start Program Development Manager.

To display the Programming Development Manager screen enter the following command:

STRPDM

Step 2: Specify Option File to Work With

On the command line enter (9), to Specify Option File to Work With. The following screen will be displayed:



NOTE: Before beginning this process see the AS/400 security officer. The file, library and member name may be different based upon the AS/400 configurations.

Enter the following information on this screen:
Enter the file name: QAUOOPT
Library name…….: QGPL
Member…….: QAUOOPT.

Step 3: User-Defined Commands.

Press F6=Create, to create the user defined options for Multi-Lingual /400.

NOTE: The following is a list of recommended Multi-Lingual/400 commands:

Option	Command		
NC	CTNLSCLP	MBR(&N)	FMSRC(&L/&F)
ND	CTNLSDSP	MBR (&N)	FMSRC(&L/&F)
NE	CTNLSPRT	MBR(&N)	FMSRC(&L/&F)
NF	CTNLSPHY	MBR (&N)	FMSRC(&L/&F)
NI	CTNLSRPG	MBR(&N)	FMSRC(&L/&F)
NL	CTNLSLF	MBR (&N)	FMSRC(&L/&F)
NM	CTNLSCMD	MBR (&N)	FMSRC(&L/&F)

Step 4: F3=Exit Program Development Management.

Chapter 4
Start-up Procedures

There are several components involved in setting up Multi-Lingual/400. Chapter four will break down each component and explain in detail the role it plays within the Multi-Lingual/400 System.

Step 1: Sign-on to the AS/400.

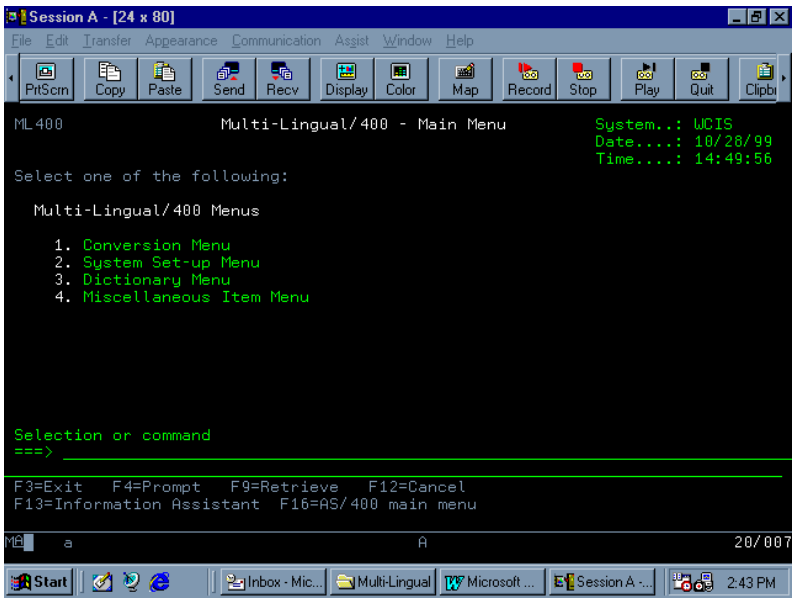
The Main Menu Screen will be displayed.

Step 2: Start Multi-Lingual/400.

On the command line enter:

GO ML400

The Multi-Lingual/400 menu selection screen will be displayed as demonstrated below:

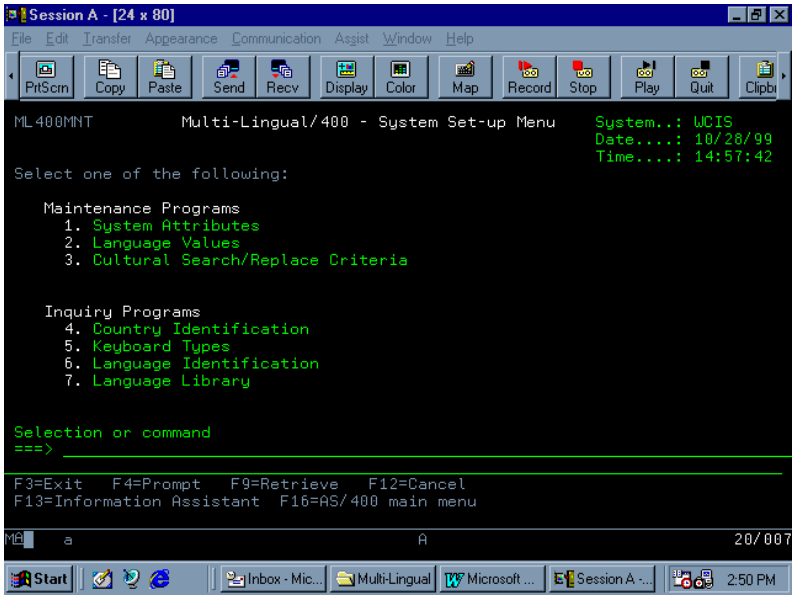


Step 3: Select System Set-up.

On the command line enter a (2) to select System Set-up.

Step 4: Display System Set-up.

The following screen will be displayed:

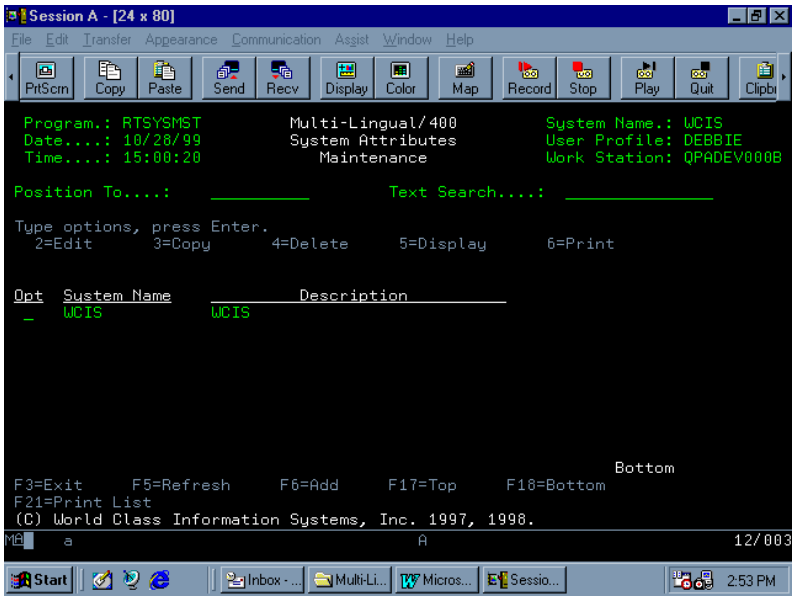


Step 5: Select System Attributes.

On the command line enter (1) to maintain the System Attributes.

Step 6: Display System Attributes Maintenance

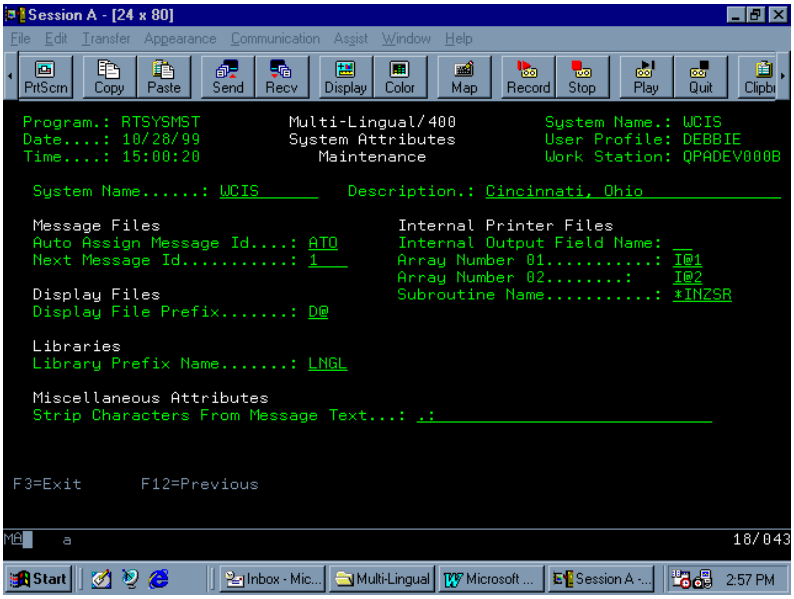
The following screen will be displayed:



Step 7: Add System Attributes.

Press function key F6=Add, to add System Attributes. Each field must be completed.

The following screen will be displayed to maintain the System Attributes:



NOTE: Many of the System Attributes Fields require unique identifiers. To allow for easier maintenance Multi-Lingual/400 recommends following your business applications naming conventions.

The following is a brief description of the fields displayed for System Attribute Maintenance and the role they play within the Multi-Lingual/400 System.

System Name

The System Name is the current system name which appears on your display. This information must be entered to identify your system.

NOTE: Use command DSPNETA to determine your AS/400 system name.

Description

The Description gives a more detailed definition of the system name.

Auto Assign Message Id

The Auto Assign Message Id, is a user defined three character prefix assigned to the Message Id. Please follow current naming conventions and verify that this prefix is not in use currently within your business applications.

Next Message Id

The Next Message Id, is an automatic sequential numeric identifier assigned to the Message Id. This number should be changed to 1 during setup.

NOTE: The Auto Assign Message Id and the Next Message Id are used jointly to create the Message Id. The default for the first Message Id created is ATO0001.

Display File Prefix

Indicates a user defined prefix used to replace the first two positions of the field name in the display file.

NOTE: The first literal converted will assign the display file field name as D@000001. The 000001 will indicate a sequential number starting over for each member. Each member will begin with 000001.

Library Prefix

Indicates a user defined prefix used to name each language library.

NOTE: If you plan to run your business applications in more than two languages such as; English, Spanish and French Canadian then you would use three language libraries as demonstrated below:

Library Name	**Text**
LNGL2924	English
LNGL2931	Spanish
LNGL2981	French Canadian

Strip Characters from Message Text

Indicates the characters that can be removed from the message text. This will decrease the number of Message Id's created.

NOTE: You can strip (.)periods or (:)colons etc… from the message text. By eliminating the periods and/or colons the conversion is completed for text only, now only one Message Id is created.

Literal
Enter Part Number……..:
Enter Part Number:

Work Field Prefix

Indicates the first two bytes of the field name for Internal Printer Files and Tables. The Internal Printer Files work in the same manner as the Display File Prefix.

NOTE: The first literal converted would assign the RPG/ILE field name as I@0001. The 0001 indicates a sequential number for each member. Each member will begin with 0001.

NOTE: Table's will be converted, using the work field's:

I@TXT=Hold Table Text
I@ID=Hold Message ID
I@FIRP=First Pass Work Field

Conversion Criteria

- The Extension Specification is used for calculation of the Work Field Prefix.
- Table names can be no more than three characters long.
- Entries Percentage tables must be equal to 1.
- The length of the entry must be greater than or equal to eight.
- The From and To file name must be equal to blanks.

Array Name 01

Indicates a user defined working array for Internal Printer files, in this case it identifies the Message ID table file at the end of each RPG/ILE program.

NOTE: The array will be created for I@1 within the RPG/ILE program.

Array Name 02

Indicates a user defined working array for Internal Printer Files, in this case it identifies the Message ID table file at the end of each RPG/ILE program.

NOTE: The array will be created for I@2 within the RPG/ILE program.

Subroutine Name

Indicates the working subroutine for the Internal Printer Files, in this case it identifies the subroutine name to load the Message Id's to the output field names.

NOTE: The subroutine will be created for *INZSR within the RPG/ILE program.

Step 8: Enter to accept.

Once all of the required fields have been entered, you may press the enter key to accept the information.

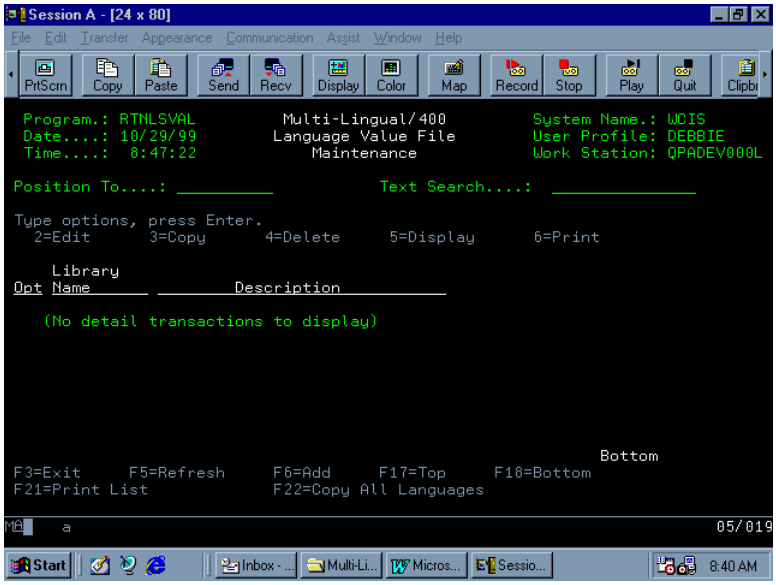
Press the F3=Exit to exit the System Attributes Screen.

Step 9: View System Set-up Menu.

On the command line enter (2) to maintain the Language Values.

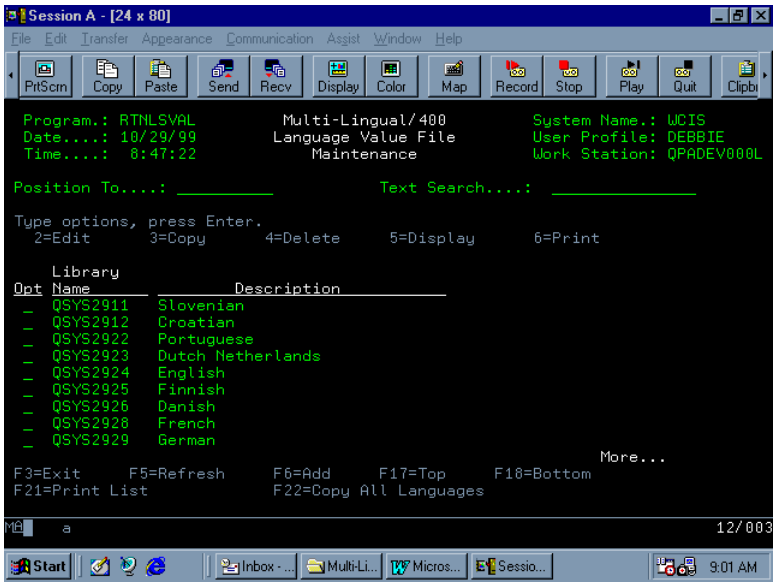
Step 10: Display Language Value Maintenance.

The following screen will be displayed:



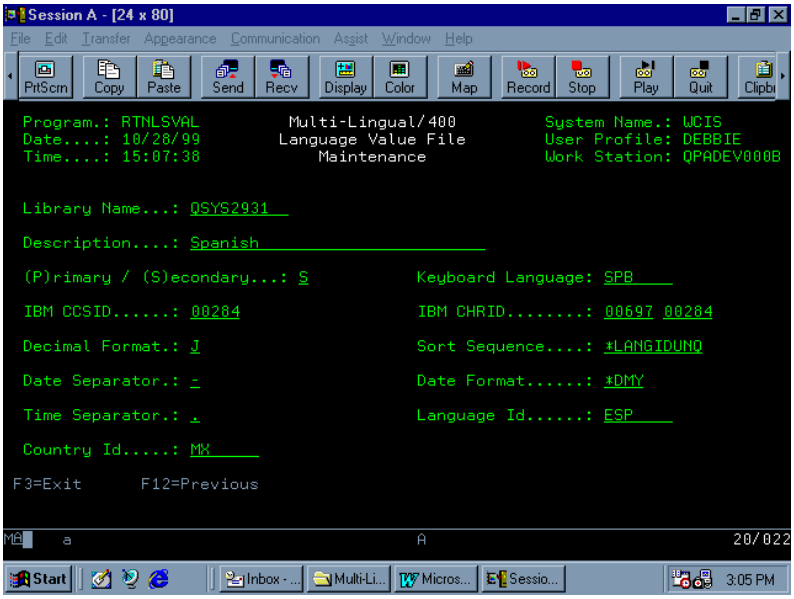
NOTE: Notice Function Key 22=Copy All Languages. This function key will copy all of the language value libraries to the language value data files. **This function key is primarily for the use of software vendors/developers.**

Example of F22=Copy All Languages:



Step 11: Add Language Values

Press function key F6=Add, to add Language Values. Each field must be completed on the following screen:



The following is a brief description of the fields displayed for the Language Values File and the role they play within the Mult-Lingual/400 System.

Library Name

The Library Name indicates the name of the source library which contains the source file for the language you have selected. Valid IBM library names are included in the appendix or may be viewed in the Language Library File Inquiry Screen.

Description

The Description is used to describe the IBM library text.

Primary/Secondary

Indicates if this language is to be the primary or secondary language.

NOTE: The primary language specifies which language the business application is written in. If the literals within the source code are English then the primary language will be QSYS2924.

Keyboard Language

Indicates the language character set in use. Valid IBM keyboard languages are included in the appendix or may be viewed in the Keyboard Language Inquiry Screen.

IBM CCSID

Indicates the code page used to identify the character set identifier for the selected language.

NOTE: Code pages must be compatible for a multilingual environment to exist. Valid IBM CCSID are included in the appendix.

IBM CHRID
Indicates a five digit prefix number used to identify the character set/ code page for the selected languages. Valid IBM CHRID are included in the appendix.

Decimal Format
Indicates the format used for decimal separators.

Sort Sequence
Indicates the sequence in which the sort will occur. The values are:

*LANGIDUNQ=Unique weight or *LANGIDSHR=Shared weight.

Date Separator
Indicates the type of date separators used.

Date Format
Indicates the format used to display the date, i.e. MM/DD/YY vs. DD/MM/YY.

Time Separator
Indicates the type of separators used in the time display.

Language ID
Indicates the default Language Identifier. Valid IBM Language ID's are included in the appendix or may be viewed in the Language ID Inquiry Screen.

Country ID
Indicates the default Country Identifier. Valid IBM Country ID's are included in the appendix or may be viewed in the Country ID Inquiry Screen.

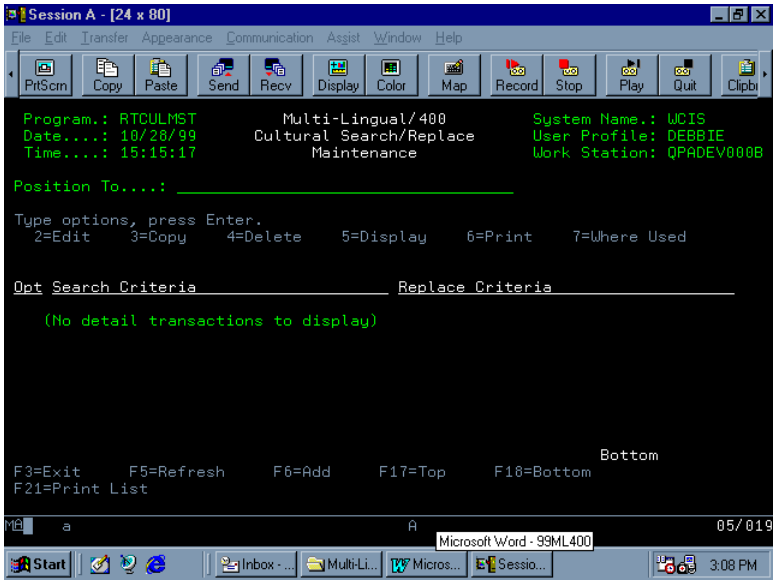
Step 12: Enter to accept.

Once all of the required fields have been entered, you may press the enter key to accept the information.

Press the F3=Exit to exit the Language Values Screen.

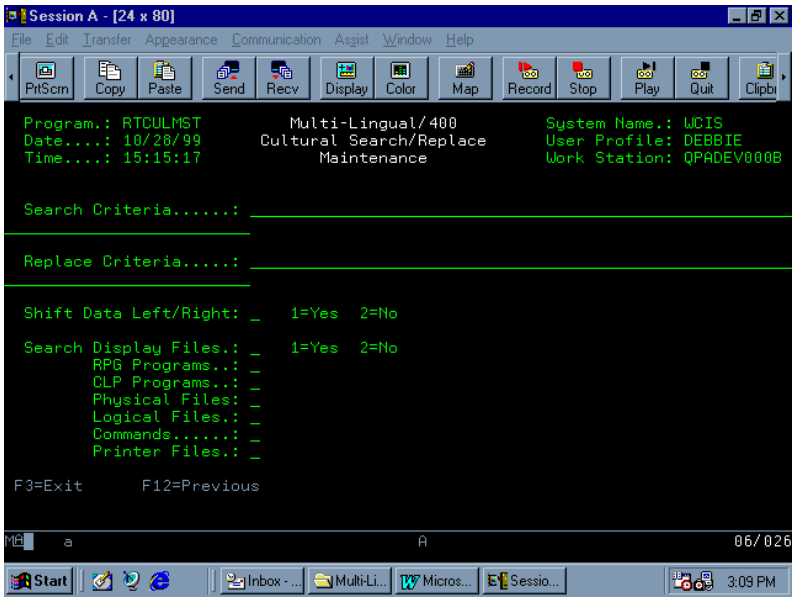
Step 13: Display Cultural Search/Replace Maintenance.

On the command line enter (3) to maintain the Cultural Search/Replace File. The following screen will be displayed:



Step 14: Add Cultural Search/Replace Values

Press function key F6=Add, to add your Cultural Search/Replace Values. Each of the following fields must be completed:



The following is a brief description of the fields displayed for the Cultural Search/Replace File and the role they play within the Multi-Lingual/400 system.

Search Criteria
Indicates the value, symbol, character or string of characters to be searched.

Replace Criteria
Indicates the replacement value for the Search Criteria.

Shift Data Left/Right
Indicates if the source code should be shifted to the left or right based upon the length of the search and replace string. Valid entries are:
1=Shift Left/Right or 2=Do not Shift Left/Right

Search Display Files
Indicates if the Display Files should be searched. Valid entries are:
1=Search or 2=Do not search

RPG/ILE Programs
Indicates if the RPG/ILE Programs should be searched. Valid entries are:
1=Search or 2=Do not search

CLP Programs
Indicates if the CLP Programs should be searched. Valid entries are:
1=Search or 2=Do not search

Physical Files
Indicates if the Physical Files should be searched. Valid entries are:
1=Search or 2=Do not search

Logical Files
Indicates if the Logical Files should be searched. Valid entries are:
1=Search or 2=Do not search

Commands
Indicates if the Commands should be searched. Valid entries are:
1=Search or 2=Do not search

Printer Files
Indicates if the Printer Files should be searched. Valid entries are:
1=Search or 2=Do not search

Examples of Search/Replace

One example of Cultural Search/Replace may be to search your current message file and replace it with the new Multi-Lingual/400 message file. The Multi-Lingual/400 message file name is FTLNGMSG.

Another example of Cultural Search/Replace would be to search for all (Yes/No) prompts and replace with (1=Yes /2=No).

NOTE: Shift Left/Right needs to be specified.

The final example demonstrated in this section is to search for all 'Y' and replace with '1', or you could search for all 'N' and replace with '2'.

Step 15: Enter to accept.

Once the required fields have been entered, press the enter key to accept the information.

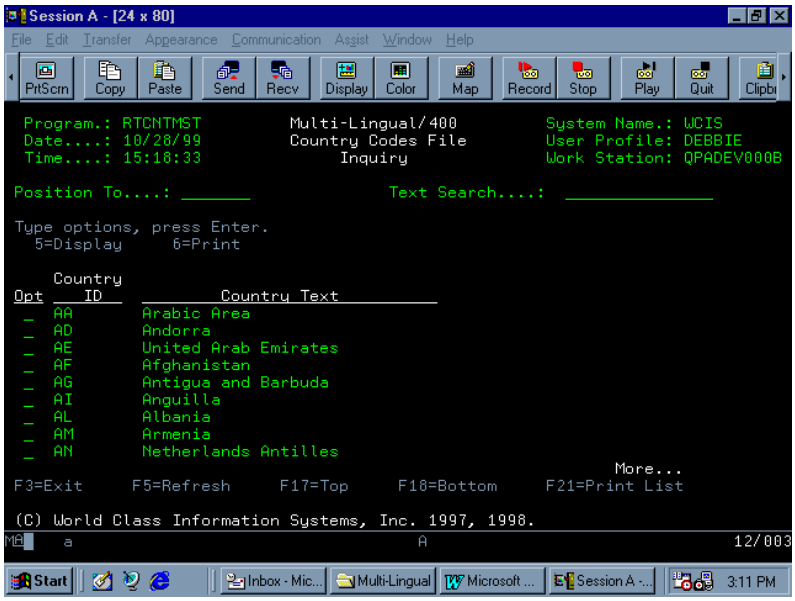
Press F3=Exit to exit the Cultural Search/Replace Screen.

Chapter 5
View the Inquiry Screens.

The following section describes the Inquiry Screens. The Inquiry Screens are included to aide in the System Set-up, you may utilize these programs or refer to the Appendix located in the back of this manual.

Step 1: Display Country Identifiers.

Enter (4) for Country Identifiers on the command line. The following screen will be displayed:



The following provides a brief explanation of the fields contained within this program.

Country Id

Indicates all valid IBM Country Identifiers. This information will be used to maintain the Country Id's in the Language Value File.

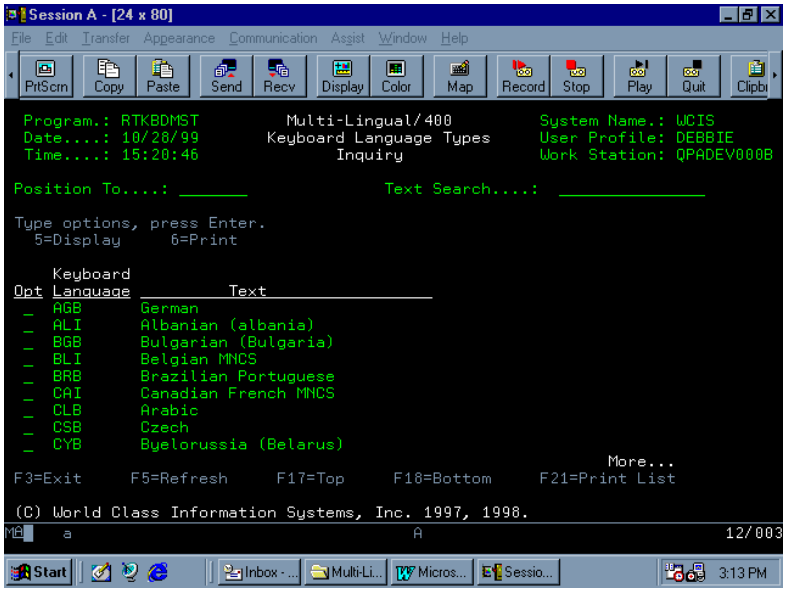
Country Text
Defines the Country Id Field.

Step 2: Return to the System Set-up Menu.

Press F3=Exit to return to the System Set-up Menu.

Step 3: Display Keyboard Language Types.

Enter (5) for Keyboard Language Types on the command line. The following screen will be displayed:



The following provides a brief explanation of the fields contained within this program.

Keyboard Language
Indicates all valid IBM language character sets for the keyboard. This information will be used to maintain the Keyboard Types in the Language Value File.

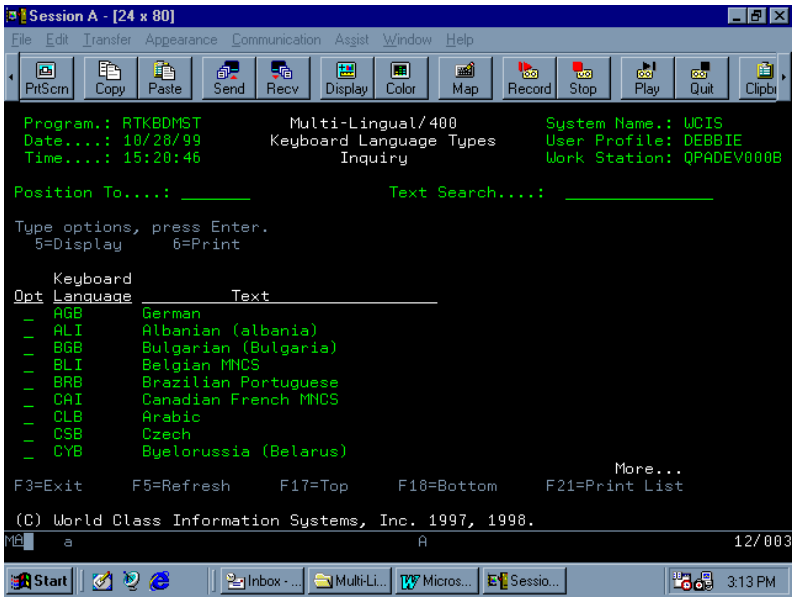
Text
Describes the IBM Keyboard Text.

Step 4: Return to the System Set-up Menu.

Press F3=Exit to return to the System Set-up Menu.

Step 5: Display Language Id File.

Enter (6) for Language Id File on the command line. The following screen will be displayed:



The following provides a brief explanation of the fields contained within this program.

Language Id

Indicates all valid IBM Language Identifier's. This information will be used to maintain the Language Id in the Language Value File.

Description

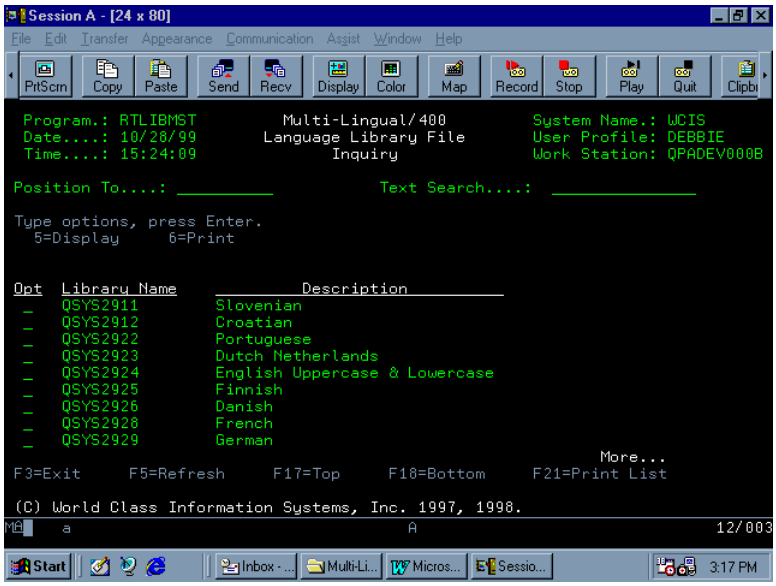
Describes the IBM Language Id Text.

Step 6: Return to the System Set-up Menu.

Press F3=Exit to return to the System Set-up Menu.

Step 7: Display Language Library File.

Enter (7) for Language Library File on the command line. The following screen will be displayed:



The following provides a brief explanation of the fields contained within this program.

Library Name
Indicates all valid IBM source libraries. This information will be used to maintain the Library Name in the Language Value File.

Description
Describes the IBM Library Text.

Step 8: Return to the System Set-up Menu.

Press F3=Exit to return to the System Set-up Menu.

Step 9: Exit the System Set-up.

Press F3=Exit to return to the Multi-Lingual/400 Main Menu.

Chapter 6
Setup For Conversion of Your Source Code

You are now ready to begin the Multi-Lingual/400 Conversion. Step one and two of this section are optional. The source code conversion may be completed in an existing library or in a separate library created for this purpose.

Step 1: Preparing for Conversion.

Create a library on the AS/400 to hold the converted source code using the following Create Library command:

CRTLIB LIB(xxxxxxx) TEXT('ML400 Converted Source Code') LIB TYPE(*PROD)

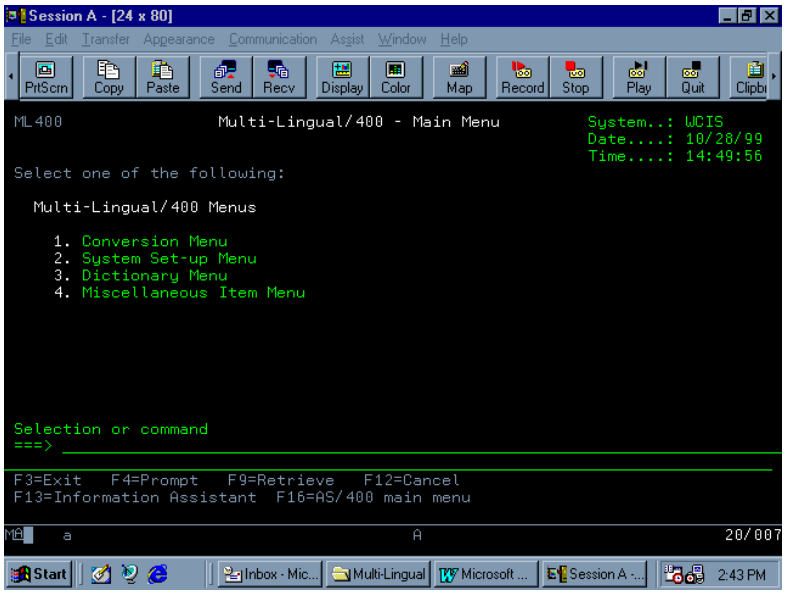
Step 2: Create Source Files.

Create the source files on the AS/400 to hold the converted files using the following commands:

CRTSRCPF FILE(xxxxxxx/*Source File*)

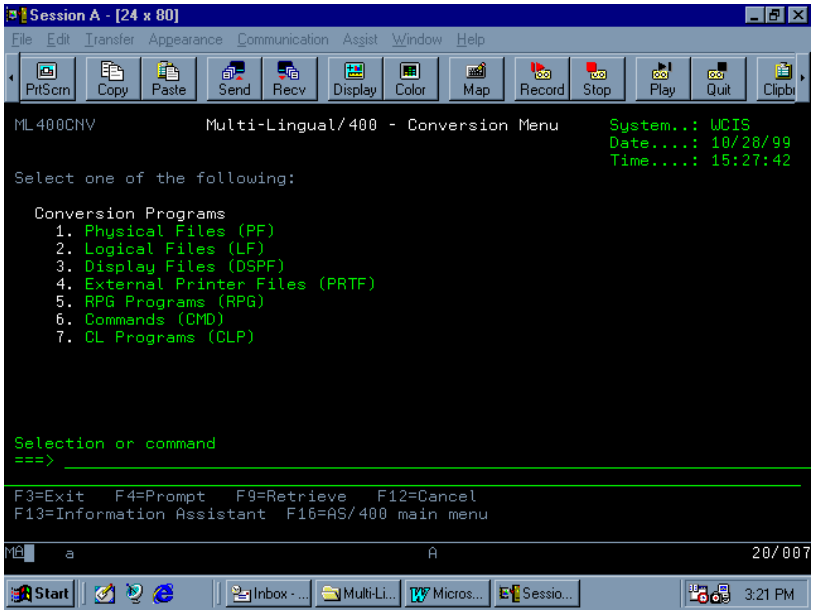
Step 3: Begin Source Code Conversion.

On the command line of the Multi-Lingual/400 Main Menu select option (1) for the Conversion Menu.



Step 4: View the Conversion Menu.

Below is the Conversion Menu Screen. The user can select Programs Files to be converted from this menu.



Step 5: Setup for Source Code Conversion is now complete.

Chapter 7
Source Code Conversion for Physical Files

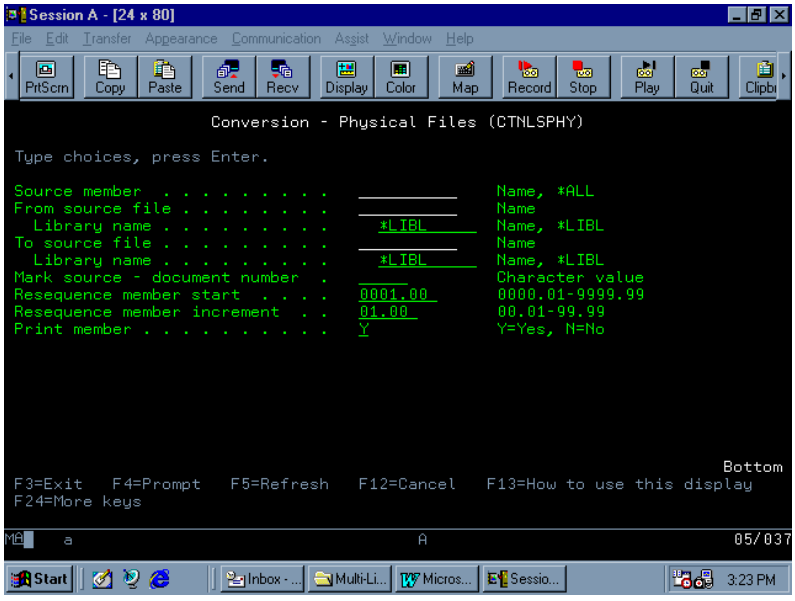
Before beginning the conversion process for Physical Files you must first determine which files need to be converted. The conversion needs to be performed if; the data being read from or written to has different CCSID's for the file and the job. The conversion process does not need to take place if; the data being read from or written to has the same CCSID's for the file and the job or if the CCSID of the job or the database file is equal to 65535.

Rules for Converting a Physical File

- The VALUES keyword must be changed for each language example of 'Yes' and 'No' type values. These values can be searched using VALUES ('Y' 'N') and replaced with VALUES ('1' '2') in the Cultural Search/Replace.
- When working with a Single Byte Character Set and a Double Byte Character Set you must create two sets of Physical Files and the Double Byte Character Set must be used as the primary language.

Step 1: Convert Physical Files.

On the command line enter (1) from the Conversion Menu to Convert Physical Files. The following screen will be displayed:



Source member
Enter the Source member name which is to be converted or enter *ALL to convert all members within the source file and library.

From source file
Enter the source file name from which this source member will be selected.

Library Name
Enter the Library name from which the source file will be selected.

To Source File
Enter the name of the source file selected to hold the converted source code.

Library Name
Enter the library name created to hold the converted source code.

Mark source – document number
To be completed if you would like to mark or indicate any changes made to the source code. This document number will be placed in positions 1-5 of the source line of code being altered.

NOTE: In all examples of source code conversion within this document changes have been marked with ML400.

Resequence member start
Type the sequence number of the line where re-sequencing should start. The range must lie between 0000.01 and 9999.99.

Resequence member increment
Type a value between 0.01 and 99.99 that will be used to increment the sequence numbers in your member.

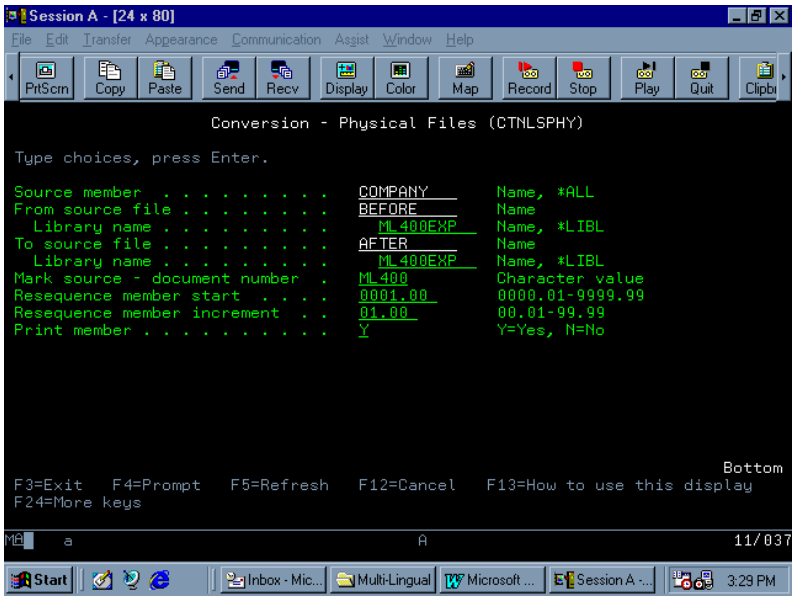
Step 2: Press Enter to process the Source Code Conversion.

Step 3: To complete the conversion process these files must be recompiled.

Example of Source Code Conversion for Physical Files:

During the Physical File conversion Multi-Lingual/400 identifies the CCSID number which was determined during System Set-up and inserts it into the source code prior to the record format per IBM standards. The CCSID indicates the code page used to identify the character set identifier for the primary language. (*Valid CCSID's are located in the appendix.)*

In this example the CCSID 00037 is used to indicate the primary language as English.



In this example the Cultural Search/Replace was created using the following criteria:

Search : 'Y' Replace : '1'
Search : 'N' Replace : '2'

Examples of Coding Changes for Physical Files

The following is an illustration depicting the Physical File before conversion and after conversion:

Before Conversion

```
Columns . . . :    1  80                                  Browse
 SEU==>
 FMT A* .....A*. 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+... 8
       ********** Beginning of data *************************************************
0001.00      A*****************************************************************
0001.10      A*    Multi-Lingual/400 Physical File Conversion                 *
0001.20      A*****************************************************************
0001.30      A*
0001.40      A                                     UNIQUE
0001.50      A          R PF                       TEXT('Physical File')
0001.60      A            CO             3P 0      TEXT('Company Number')
0001.70      A            CONAME        30A        TEXT('Company Name')
0001.80      A            COADD1        30A        TEXT('Company Address #1')
0001.90      A            COADD2        30A        TEXT('Company Address #2')
0002.00      A            COADD3        30A        TEXT('Company Address #3')
0002.10      A            COADD4        30A        TEXT('Company Address #4')
0002.20      A          K CO
       ****************** End of data ***************************************************
```

After Conversion

```
Columns . . . :    1  80                                  Browse
 SEU==>
 FMT A* .....A*. 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+... 8
        ********** Beginning of data *************************************************
0001.00      A*****************************************************************
0002.00      A*    Multi-Lingual/400 Physical File Conversion               *
0003.00      A*****************************************************************
0004.00      A*
0005.00      A                                    UNIQUE
0006.00 ML400A                                    CCSID(00284)
0007.00      A          R PF                      TEXT('Physical File')
0008.00      A            CO             3P 0     TEXT('Company Number')
0009.00      A            CONAME        30A       TEXT('Company Name')
0010.00      A            COADD1        30A       TEXT('Company Address #1')
0011.00      A            COADD2        30A       TEXT('Company Address #2')
0012.00      A            COADD3        30A       TEXT('Company Address #3')
0013.00      A            COADD4        30A       TEXT('Company Address #4')
0014.00      A          K CO
        ***************** End of data ***************************************************
```

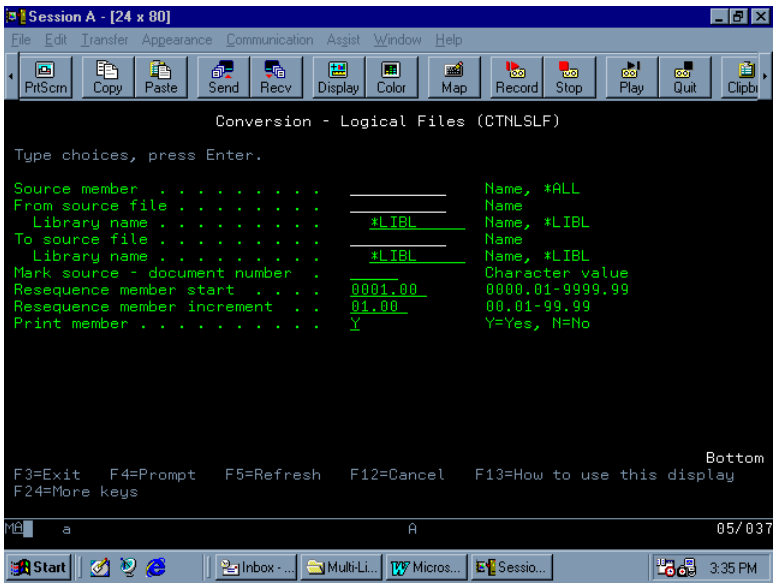
Chapter 8
Source Code Conversion for Logical Files

A Logical file conversion will take place if; the data being read from or written to has different CCSID's for the file and the job. The conversion will not take place if; the data being read from or written to has the same CCSID's for the file and the job or if the CCSID of the job or the database file is equal to 65535.

Note – This source code conversion MUST be bypassed for OS/400 V5R1M0 and higher.

Step 1: Convert Logical Files.

On the command line enter (2) from the Conversion Menu to Convert Logical Files. The following screen will be displayed:



Source member

Enter the Source member name which is to be converted or enter *ALL to convert all members within the source file and library.

From source file

Enter the source file name from which this source member will be selected.

Library Name

Enter the Library name from which the source file will be selected.

To Source File
Enter the name of the Source File selected to hold the converted source code.

Library Name
Enter the library name created to hold the converted source code.

Mark source – document number
To be completed if you would like to mark or indicate any changes made to the source code. This document number will be placed in positions 1-5 of the source line of code being altered.

NOTE: In all examples of source code conversion within this document changes have been marked with ML400.

Resequence member start
Type the sequence number of the line where re-sequencing should start. The range must lie between 0000.01 and 9999.99.

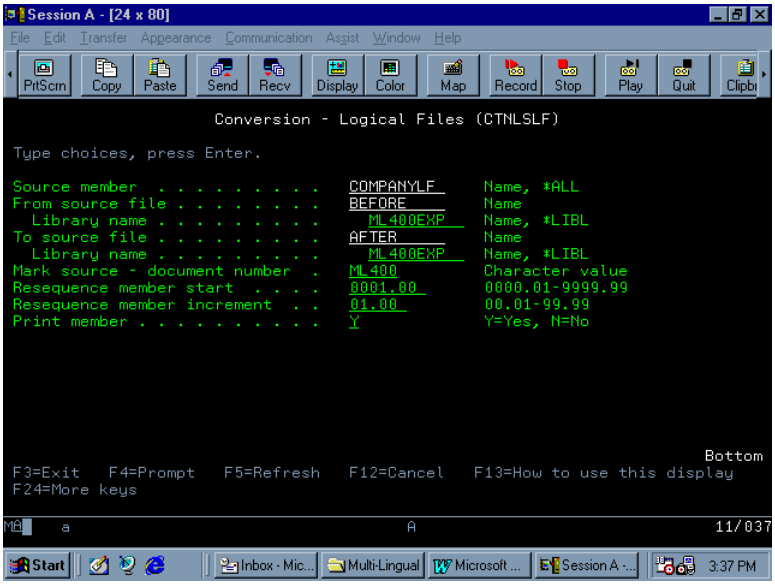
Resequence member increment
Type a value between 0.01 and 99.99 that will be used to increment the sequence numbers in your member.

Step 2: Press Enter to process the Source Code Conversion.

Step 3: To complete the conversion process these files must be recompiled.

Example of Source Code Conversion for Logical Files:

During the Logical File conversion Multi-Lingual/400 identifies the CCSID number which was determined during the System Set-up. It is then inserted into the source code prior to the record format per IBM standards. The CCSID indicates the code page used to identify the character set identifier for the primary language. (*Valid CCSID's are located in the appendix.)*



In this example the CCSID 00037 is used to indicate the primary language as English.

The following is an illustration depicting the Logical File before conversion and after conversion.

Before Conversion

```
Columns . . . :    1  80                                  Browse
 SEU==>
 FMT A* .....A*. 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+... 8
       ********** Beginning of data *************************************************
0001.00      A*************************************************************
0002.00      A*    Multi-Lingual/400 Logical File Conversion                *
0003.00      A*************************************************************
0004.00      A*
0005.00      A          R PF                        PFILE(PHYSICAL)
0006.00      A          K CONAME
       ***************** End of data ***************************************************
```

After Conversion

```
Columns . . . :    1  80                                  Browse
 SEU==>
 FMT A* .....A*. 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+... 8
       ********** Beginning of data *************************************************
0001.00      A*************************************************************
0002.00      A*    Multi-Lingual/400 Logical File Conversion                *
0003.00      A*************************************************************
0004.00      A*
0005.00 ML400A                                  CCSID(00284)
0006.00      A          R PF                        PFILE(PHYSICAL)
0007.00      A          K CONAME
       ***************** End of data ***************************************************
```

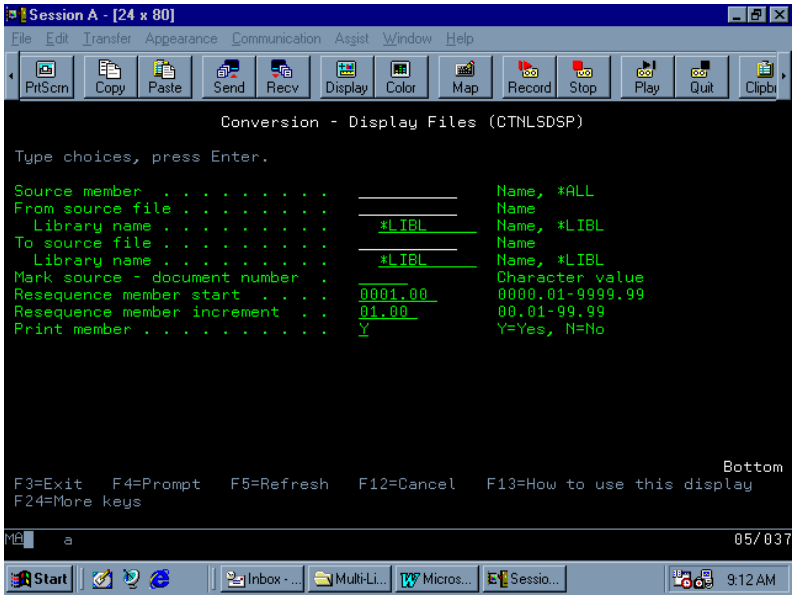
Chapter 9
Source Code Conversion for Display Files

Before beginning the conversion of Display Files you should be aware of the following:

- The existing ERRMSGID and SFLMSGID keywords, message file can be replaced with the new Multi-Lingual/400 message file. This can be done in the Cultural Search/Replace Utility.
- The VALUES keyword must be changed for each language example of 'Yes' and 'No' type values. These values can be searched using VALUES ('Y' 'N') to replace with VALUES ('1' '2') in the Cultural Search/Replace.

Step 1: Convert Display Files.

On the command line enter (3) from the Conversion Menu to Convert Display Files. The following screen will be displayed:



Source member

Enter the Source member name which is to be converted or enter *ALL to convert all members within the source file and library.

From source file
Enter the source file name from which this source member will be selected.

Library Name
Enter the Library name from which the source file will be selected.

To Source File
Enter the name of the Source file selected to hold the converted source code.

Library Name
Enter the library name created to hold the converted source code.

Mark source – document number
To be completed if you would like to mark or indicate any changes made to the source code. This document number will be placed in positions 1-5 of the source line of code being altered.

NOTE: In all examples of source code conversion within this document changes have been marked with ML400.

Resequence member start
Type the sequence number of the line where re-sequencing should start. The range must lie between 0000.01 and 9999.99.

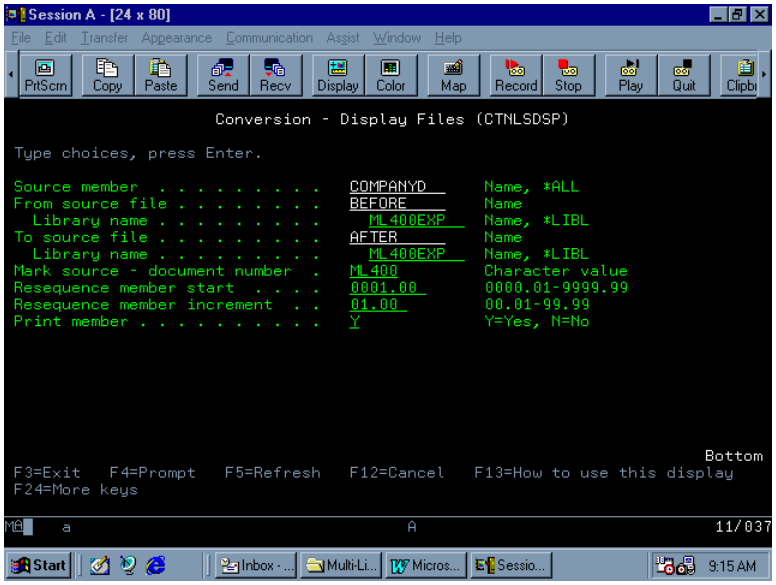
Resequence member increment
Type a value between 0.01 and 99.99 that will be used to increment the sequence numbers in your member.

Step 2: Press Enter to process the Source Code Conversion.

Step 3: To complete the conversion process these files must be recompiled.

Example of Source Code Conversion for Display Files:

During the Display File conversion Multi-Lingual/400 attaches a Display File Prefix and Message Id to all literals and inserts it into the source code. The Display File Prefix is required by IBM to name a Database Display Field. The Message Id is then used to retrieve the message text for display purposes.



The ERRMSG and SFLMSG keywords will be replaced with ERRMSGID and SFLMSGID. This will remove the hard literals and replace them with Message Id's.

Before Conversion

```
Columns . . . :    1  80                                  Browse
 SEU==>
 FMT A* .....A*. 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+... 8
       ********** Beginning of data *************************************************
0001.00      A*************************************************************
0002.00      A*    Multi-Lingual/400 Display File Conversion                *
0003.00      A*************************************************************
0004.00      A*
0005.00      A                                      DSPSIZ(24 80 *DS3)
0006.00      A                                      REF(*LIBL/PHYSICAL)
0007.00      A          R SCR1
0008.00      A*%%TS  SD  19980514  133120  KPM         REL-V3R2M0  5763-PW1
0009.00      A                                      CA03
0010.00      A                                      CA12
0011.00      A                                      ROLLUP(27 'SEE PREVIOUS')
0012.00      A                                      ROLLDOWN(26 'SEE NEXT')
0013.00      A                                    1  3DATE
0014.00      A                                      EDTCDE(Y)
0015.00      A                                    1 12TIME
0016.00      A                                    1 22'Company Master File Maintenance'
0017.00      A                                      DSPATR(HI)
0018.00      A                                    1 53'C/N'
0019.00      A                                    1 58'System..:'
0020.00      A                                    1 68SYSNAME
0021.00      A                                    4  6'Company Number..........:'
0022.00      A            CO        R        B  4 32TEXT('COMPANY NUMBER')
0023.00      A                                      EDTCDE(3)
0024.00      A                                      DSPATR(UL)
0025.00      A  79                                  ERRMSG('Company number is not on fi-
0026.00      A                                      le.')
0027.00      A  35                                  ERRMSG('Beginning of file has been -
0028.00      A                                      reached.' 35)
0029.00      A  34                                  ERRMSG('End of file has been reache-
0030.00      A                                      d.' 34)
0031.00      A                                    6  6'Company Name............:'
0032.00      A            CONAME    R        B  6 32
0033.00      A  77                                  ERRMSG('The company name cannot be -
0034.00      A                                      equal to blanks.' 77)
0035.00      A                                    8  6'Address.................:'
0036.00      A            COADD1    R        B  8 32
0037.00      A  78                                  ERRMSG('The Address Cannot Be equal-
0038.00      A                                       to blanks.' 78)
0039.00      A            COADD2    R        B  9 32
0040.00      A  76                                  ERRMSG('The Address Cannot Be equal-
0041.00      A                                       to blanks.' 76)
0042.00      A            COADD3    R        B 10 32
0043.00      A            COADD4    R        B 11 32
0044.00      A                                   14  6'This demo was created to display t-
0045.00      A                                       he use of message Identification.'
0046.00      A                                   22  4'F3=Exit'
0047.00      A                                       COLOR(BLU)
0048.00      A                                   22 16'F12=Cancel'
0049.00      A                                       COLOR(BLU)
       ********** End of data *********************************************************
```

After Conversion

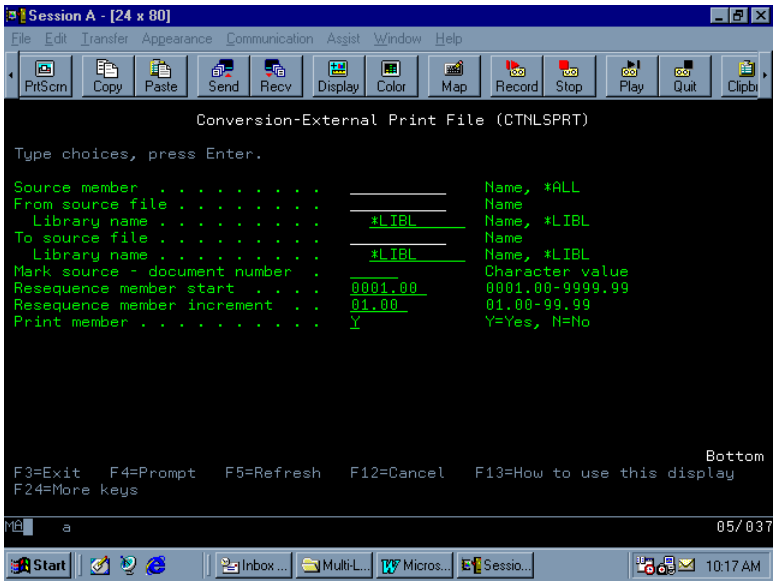
```
Columns . . . :    1  80                                  Browse
 SEU==>
 FMT A* .....A*. 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+... 8
        ********** Beginning of data *************************************************
0001.00      A*************************************************************
0002.00      A*    Multi-Lingual/400 Display File Conversion                *
0003.00      A*************************************************************
0004.00      A*
0005.00      A                                     DSPSIZ(24 80 *DS3)
0006.00      A                                     REF(*LIBL/PHYSICAL)
0007.00      A          R SCR1
0008.00      A*%%TS  SD  19980514  133120  KPM        REL-V3R2M0  5763-PW1
0009.00      A                                     CA03
0010.00      A                                     CA12
0011.00      A                                     ROLLUP(27 'SEE PREVIOUS')
0012.00      A                                     ROLLDOWN(26 'SEE NEXT')
0013.00      A                                  1  3DATE
0014.00      A                                     EDTCDE(Y)
0015.00      A                                  1 12TIME
0016.00 ML400A*                                  1 22'Company Master File Maintenance'
0017.00 ML400A            D#000001      31A  O  1 22MSGID(ATH0031 *LIBL/FTLNGMSG)
0018.00      A                                     DSPATR(HI)
0019.00 ML400A*                                  1 53'C/N'
0020.00 ML400A            D#000002      03A  O  1 53MSGID(ATH0032 *LIBL/FTLNGMSG)
0021.00 ML400A*                                  1 58'System..:'
0022.00 ML400A            D#000003      09A  O  1 58MSGID(ATH0033 *LIBL/FTLNGMSG)
0023.00      A                                   1 68SYSNAME
0024.00 ML400A*                                  4  6'Company Number..........:'
0025.00 ML400A            D#000004      25A  O  4  6MSGID(ATH0034 *LIBL/FTLNGMSG)
0026.00      A            CO        R         B  4 32TEXT('COMPANY NUMBER')
0027.00      A                                     EDTCDE(3)
0028.00      A                                     DSPATR(UL)
0029.00 ML400A* 79                                ERRMSG('Company number is not on fi-
0030.00 ML400A*                                   le.')
0031.00 ML400A  79                                ERRMSGID(ATH0035 *LIBL/FTLNGMSG)
0032.00 ML400A* 35                                ERRMSG('Beginning of file has been -
0033.00 ML400A*                                   reached.' 35)
0034.00 ML400A  35                                ERRMSGID(ATH0036 *LIBL/FTLNGMSG)
0035.00 ML400A* 34                                ERRMSG('End of file has been reache-
0036.00 ML400A*                                   d.' 34)
0037.00 ML400A  34                                ERRMSGID(ATH0037 *LIBL/FTLNGMSG)
0038.00 ML400A*                                  6  6'Company Name............:'
0039.00 ML400A            D#000005      25A  O  6  6MSGID(ATH0038 *LIBL/FTLNGMSG)
0040.00      A            CONAME    R         B  6 32
0041.00 ML400A* 77                                ERRMSG('The company name cannot be -
0042.00 ML400A*                                   equal to blanks.' 77)
0043.00 ML400A  77                                ERRMSGID(ATH0039 *LIBL/FTLNGMSG)
0044.00 ML400A*                                  8  6'Address.................:'
0045.00 ML400A            D#000006      25A  O  8  6MSGID(ATH0040 *LIBL/FTLNGMSG)
0046.00      A            COADD1    R         B  8 32
0047.00 ML400A* 78                                ERRMSG('The Address Cannot Be equal-
0048.00 ML400A*                                    to blanks.' 78)
0049.00 ML400A  78                                ERRMSGID(ATH0041 *LIBL/FTLNGMSG)
0050.00      A            COADD2    R         B  9 32
0051.00 ML400A* 76                                ERRMSG('The Address Cannot Be equal-
0052.00 ML400A*                                    to blanks.' 76)
0053.00 ML400A  76                                ERRMSGID(ATH0041 *LIBL/FTLNGMSG)
0054.00      A            COADD3    R         B 10 32
0055.00      A            COADD4    R         B 11 32
0056.00 ML400A*                                  14  6'This demo was created to display t-
0057.00 ML400A*                                     he use of message Identification.'     )
0058.00 ML400A            D#000007      67A  O 14  6MSGID(ATH0042 *LIBL/FTLNGMSG)
0059.00 ML400A*                                  22  4'F3=Exit'
0060.00 ML400A            D#000008      07A  O 22  4MSGID(ATH0043 *LIBL/FTLNGMSG)
0061.00      A                                     COLOR(BLU)
0062.00 ML400A*                                  22 16'F12=Cancel'
0063.00 ML400A            D#000009      10A  O 22 16MSGID(ATH0044 *LIBL/FTLNGMSG)
0064.00      A                                     COLOR(BLU)
        ********** End of data *******************************************************
```

Chapter 10
Source Code Conversion for External Printer Files

The conversion of the External Printer files works similar to the conversion of the Display Files.

Step 1: Convert External Printer Files.

On the command line enter (4) from the Conversion Menu to Convert External Printer Files. The following screen will be displayed:



Source member

Enter the Source Member Name which is to be converted or enter *ALL to convert all members within the source file and library.

From source file

Enter the source file name from which this source member will be selected.

Library Name

Enter the Library name from which the source file will be selected.

To Source File

Enter the name of the Source file selected to hold the converted source code.

Library Name
Enter the library name created to hold the converted source code.

Mark source – document number
To be completed if you would like to mark or indicate any changes made to the source code. This document number will be placed in positions 1-5 of the source line of code being altered.

NOTE: In all examples of source code conversion within this document changes have been marked with ML400.

Resequence member start
Type the sequence number of the line where re-sequencing should start. The range must lie between 0000.01 and 9999.99.

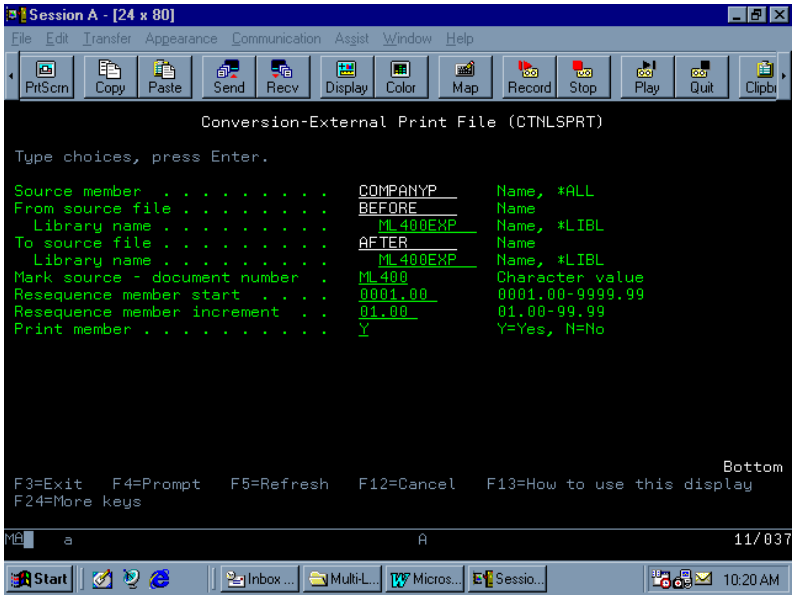
Resequence member increment
Type a value between 0.01 and 99.99 that will be used to increment the sequence numbers in your member.

Step 2: Press Enter to process the Source Code Conversion.

Step 3: To complete the conversion process these files must be recompiled.

Example of Source Code Conversion for External Printer Files:

During the Printer File conversion Multi-Lingual/400 replaces all literals and inserts the MSGCON keyword into the source code. The Message Id is then used to retrieve the message text for printing purposes.



Before Conversion

```
Columns . . . :    1  80                                  Browse
 SEU==>
 FMT A* .....A*. 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+... 8
       ************** Beginning of data ********************************************************
0001.00      A*%%******************************************************************************
0002.00      A*%%TS  RD  20000119  132734  CHRISTY     REL-V3R7M0  5769-PW1
0003.00      A*%%FI+1066010000000000000000000000000000000000000000000000000000000000
0004.00      A*%%FI       00000000000000000000000000000000000000000000000000000000
0005.00      A*%%******************************************************************************
0006.00      A*************************************************************
0007.00      A*************                                     *************
0008.00      A**********   WORLD CLASS INFORMATION SYSTEMS, INC.  **********
0009.00      A*******         COPYRIGHT (C) 1991, 1992, 1993         *******
0010.00      A**********            ALL RIGHTS RESERVED           **********
0011.00      A*************     (LICENSED PROGRAM MATERIAL)    *************
0012.00      A****************                                 ****************
0013.00      A*************************************************************
0014.00      A*
0015.00      A*  DESCRIPTION..: PRINTER FILE
0016.00      A*  AUTHOR.......: K.MAHANEY
0017.00      A*  DATE.........: 08/30/91
0018.00      A*
0019.00      A*************************************************************
0020.00      A*
0021.00      A*  MAINTENANCE AUDIT
0022.00      A*
0023.00      A*  PROJECT
0024.00      A*  NUMBER    PROGRAMMER      DATE      SHORT DESCRIPTION
0025.00      A*  -------   ------------  ---------   ----------------------
0026.00      A*
0027.00      A*************************************************************
0028.00      A                                      REF(ML400EXP/PHYSICAL)
0029.00      A          R PKGHDR
0034.00      A                                      SKIPB(003)
0035.00      A                                    28
0036.00      A                                      'Multi-Lingual/400'
0040.00      A          R TITLE
0044.00      A                                      SPACEB(001)
0045.00      A            DSPDAT         8A  O     1
0046.00      A            TIME           6S 0O    10
0047.00      A                                      EDTWRD('  :  :  ')
0048.00      A                                    23
0049.00      A                                      'Company Master File Listing '
0050.00      A                                      UNDERLINE
0051.00      A            USER          10A  O    57
0052.00      A                                    69
0053.00      A                                      'Page -'
0054.00      A                                    76
0055.00      A                                      PAGNBR
0056.00      A                                      EDTCDE(Z)
0061.00      A          R HEADR01
0066.00      A                                      SPACEB(003)
0070.00      A          R HEADR02
0075.00      A                                      SPACEB(002)
0076.00      A                                     1
0077.00      A                                      'Company Number'
0078.00      A                                    18
0079.00      A                                      'Company Name'
0083.00      A          R DETAIL
0087.00      A                                      SPACEB(001)
0088.00      A            CO             3S 0O     1
0089.00      A            CONAME        30A  O   +14
0093.00      A          R ENDLST
0098.00      A                                      SPACEB(003)
0099.00      A                                     1
0100.00      A                                      '** End Of Listing For Program -'
0101.00      A            PGM           10A  O    33
0102.00      A                                    +1
0103.00      A                                      '**'
       ****************** End of data ***************************************************
```

After Conversion

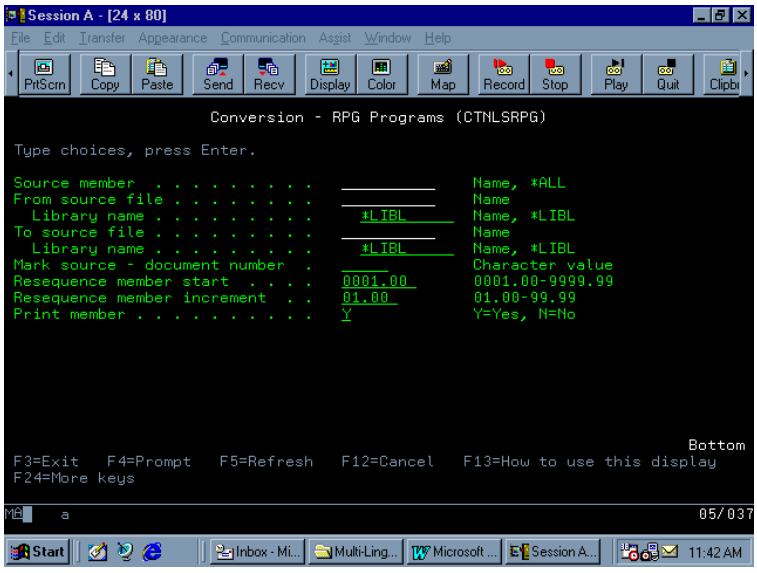
```
Columns . . . :   1  80                  Browse
 SEU==>
 FMT A* .....A*. 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+... 8
      ********** Beginning of data *************************************************
0001.00      A*%%***************************************************************************
0002.00      A*%%TS  RD  19980812  101520  KPM         REL-V3R2M0  5763-PW1
0003.00      A*%%FI+1066010000000000000000000000000000000000000000000000000000000000
0004.00      A*%%FI       000000000000000000000000000000000000000000000000000000000
0005.00      A*%%***************************************************************************
0006.00      A*************************************************************
0007.00      A*************                                     *************
0008.00      A**********   WORLD CLASS INFORMATION SYSTEMS, INC.  **********
0009.00      A*******         COPYRIGHT (C) 1991, 1992, 1993         *******
0010.00      A**********            ALL RIGHTS RESERVED           **********
0011.00      A*************     (LICENSED PROGRAM MATERIAL)    *************
0012.00      A****************                                 ****************
0013.00      A*************************************************************
0014.00      A*
0015.00      A*  DESCRIPTION..: PRINTER FILE
0016.00      A*  AUTHOR.......: K.MAHANEY
0017.00      A*  DATE.........: 08/30/91
0018.00      A*
0019.00      A*************************************************************
0020.00      A*
0021.00      A*  MAINTENANCE AUDIT
0022.00      A*
0023.00      A*  PROJECT
0024.00      A*  NUMBER    PROGRAMMER      DATE      SHORT DESCRIPTION
0025.00      A*  -------   ------------  ---------   ----------------------
0026.00      A*
0027.00      A*************************************************************
0028.00      A                                      REF(ML400EXP/PHYSICAL)
0029.00      A          R PKGHDR
0034.00      A                                      SKIPB(003)
0035.00      A                                     28
0036.00 ML400A*                                      'Multi-Lingual/400'
0037.00 ML400A                                       MSGCON(17 ATO0161 *LIBL/FTLNGMSG)
0041.00      A          R TITLE
0045.00      A                                      SPACEB(001)
0046.00      A            DSPDAT         8A  O     1
0047.00      A            TIME           6S 0O    10
0048.00      A                                      EDTWRD('  :  :  ')
0049.00      A                                     23
0050.00 ML400A*                                      'Company Master File Listing '
0051.00 ML400A                                       MSGCON(28 ATO0003 *LIBL/FTLNGMSG)
0052.00      A                                       UNDERLINE
0053.00      A            USER          10A  O    57
0054.00      A                                     69
0055.00 ML400A*                                      'Page -'
0056.00 ML400A                                       MSGCON(06 ATO0004 *LIBL/FTLNGMSG)
0057.00      A                                     76
0058.00      A                                       PAGNBR
0059.00      A                                       EDTCDE(Z)
0064.00      A          R HEADR01
0069.00      A                                      SPACEB(003)
0073.00      A          R HEADR02
0078.00      A                                      SPACEB(002)
0079.00      A                                      1
0080.00 ML400A*                                      'Company Number'
0081.00 ML400A                                       MSGCON(14 ATO0005 *LIBL/FTLNGMSG)
0082.00      A                                     18
0083.00 ML400A*                                      'Company Name'
0084.00 ML400A                                       MSGCON(12 ATO0006 *LIBL/FTLNGMSG)
0088.00      A          R DETAIL
0092.00      A                                      SPACEB(001)
0093.00      A            CO             3S 0O     1
0094.00      A            CONAME        30A  O   +14
0098.00      A          R ENDLST
0103.00      A                                      SPACEB(003)
0104.00      A                                      1
0105.00 ML400A*                                      '** End Of Listing For Program -'
0106.00 ML400A                                       MSGCON(31 ATO0007 *LIBL/FTLNGMSG)
0107.00      A            PGM           10A  O    33
0108.00      A                                     +1
0109.00 ML400A*                                      '**'
0110.00 ML400A                                       MSGCON(02 ATO0008 *LIBL/FTLNGMSG)
   ********** End of data *************************************************
```

Chapter 11
Source Code Conversion for RPG/ILE Programs (RPG/ILE)

The source code conversion for RPG/ILE Programs is used to replace all output specifications and set table files to use Message ID's.

Step 1: Convert RPG/ILE Programs.

On the command line enter (5) from the conversion menu to Convert RPG/ILE Programs. The following screen will be displayed.



Source member
Enter the Source member name which is to be converted or enter *ALL to convert all members within the source file and library.

From source file
Enter the Source File name from which this source member will be selected.

Library Name
Enter the Library Name from which the source file will be selected.

To Source File
Enter the name of the Source File selected to hold the converted source code.

Library Name
Enter the library name created to hold the converted source code.

Mark source – document number
To be completed if you would like to mark or indicate any changes made to the source code. This document number will be placed in positions 1-5 of the source line of code being altered.

NOTE: In all examples of source code conversion within this document changes have been marked with ML400.

Resequence member start
Type the sequence number of the line where re-sequencing should start. The range must lie between 0000.01 and 9999.99.

Resequence member increment
Type a value between 0.01 and 99.99 that will be used to increment the sequence numbers in your member.

Step 2: Press Enter to process the Source Code Conversion.

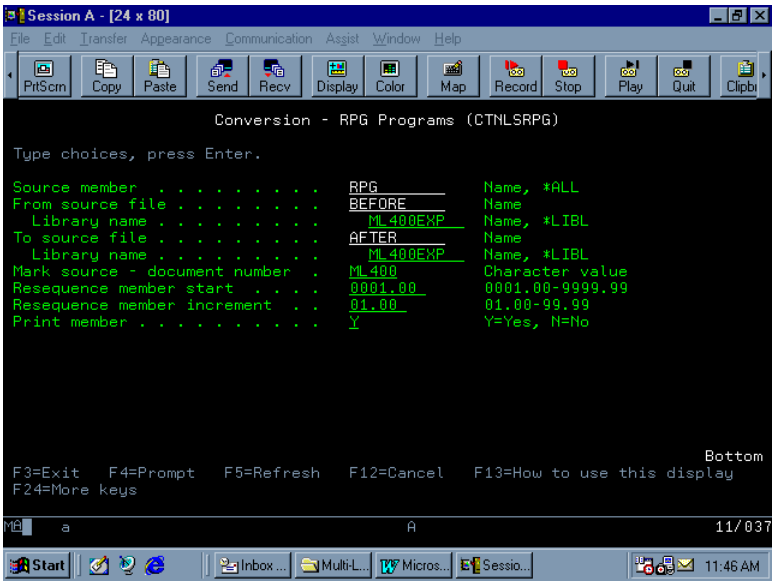
Step 3: To complete the conversion process these files must be recompiled.

Example of Source Code Conversion for RPG/ILE Programs:

For Internal Printer Files
During the RPG/ILE Program conversion Multi-Lingual/400 replaces all output specifications and inserts the Database Output Field into the source code. The database field is used to move the Message Id text into the field for printing purposes.

For Table Files

During the RPG/ILE Program conversion Multi-Lingual/400 replaces the Table files with Message ID's. At run time the Message ID is converted to the message text.



Before Conversion

```
Columns . . . :    1  80                                  Browse
 SEU==>
 FMT FX .....FFilenameIPEAF........L..I........Device+......KExit++Entry+A....U1........
       ************** Beginning of data *********************************************
0001.00      FPHYSICALIF  E           K        DISK
0002.00      FQSYSPRT O   F     132     OF     PRINTER
0003.00      E                    OTH     1   2 10
0004.00      E                    TABNAM  1   3 10   TABDSC 30
0005.00      E                    MSG     1   3 30               TEST COMMENTS
0006.00      IPF          01
0007.00      C*
0008.00      C* INITIALIZE THE DATA FIELDS
0009.00      C*
0010.00      C                     TIME           TIMDAT 120       TIME AND DATE
0011.00      C                     MOVE TIMDAT    DATE    60       SYSTEM DATE
0012.00      C                     MOVELTIMDAT    TIME    60       SYSTEM TIME
0013.00      C*
0014.00      C* PRINT HEADINGS
0015.00      C*
0016.00      C                     EXCPTHEADER
0017.00      C*
0018.00      C* SET THE FILE
0019.00      C*
0020.00      C           *LOVAL    SETLLPHYSICAL
0021.00      C*
0022.00      C           *INLR     DOUEQ'1'
0023.00      C*
0024.00      C* READ THE FILE UNTIL END OF DATA
0025.00      C*
0026.00      C                     READ PHYSICAL                LR
0027.00      C           *INLR     IFEQ '0'
0028.00      C*
0029.00      C* TEST FOR OVERFLOW
0030.00      C*
0031.00      C           *INOF     IFEQ '1'
0032.00      C                     EXCPTHEADER
0033.00      C                     SETOF                     OF
0034.00      C                     END
0035.00      C*
0036.00      C* PRINT THE DETAIL RECORDS
0037.00      C*
0038.00      C                     EXCPTDETAIL
0039.00      C*
0040.00      C                     END
0041.00      C                     END
0042.00      OQSYSPRT E  101            HEADER
0043.00      O                                    20 'Multi-Lingual/400'
0044.00      OQSYSPRT E  2              HEADER
0045.00      O                          UDATE Y    8
0046.00      O                          TIME      17 '  :  :  '
0047.00      O                                    45 'Company Master File'
0048.00      O                                       ' Listing'
0049.00      OQSYSPRT E  1              HEADER
0050.00      O                                    14 'Company Number'
0051.00      O                                    29 'Company Name'
0052.00      OQSYSPRT E  1              DETAIL
0053.00      O                          CO         3
0054.00      O                          CONAME    44
0055.00      OQSYSPRT E  1              DETAIL
0056.00      O                          TABNAM    10
0057.00      O                          TABDSC    44
0058.00      OQSYSPRT E  1              DETAIL
0059.00      O                          OTH      132
0060.00      OQSYSPRT E  1              DETAIL
0061.00      O                          MSG      132
0062.00 ** OTH
0063.00 COMPANY
0064.00 CUSTOMER
0065.00 ** TABNAM
0066.00 ERROR
0067.00 ERROR 01
0068.00 ERROR 02
0069.00 ** MSG
0070.00 DATE IS NOT VALID
0071.00 COMPANY IS NOT VALID
       ***************** End of data ***************************************************
```

After Conversion

```
Columns . . . :    1  80                                  Browse
 SEU==>
 FMT FX .....FFilenameIPEAF........L..I........Device+......KExit++Entry+A....U1........
       *************** Beginning of data ************************************************
0001.00      FPHYSICALIF  E           K        DISK
0002.00      FQSYSPRT O   F     132     OF     PRINTER
0003.00      E                    OTH     1   2 10
0004.00      E                    TABNAM  1   3 10   TABDSC 30
0005.00      E                    MSG     1   3 30              TEST COMMENTS
0006.00 ML400E                    I#1     1 004  7
0007.00 ML400E                    I#2       004 80
0008.00      IPF          01
0009.00 ML400C*
0010.00 ML400C* Execute Subroutine To Load The Language Arrays
0011.00 ML400C*-------------------------
0012.00 ML400C           I#FIRP    CASEQ*BLANKS   ATHLNG
0013.00 ML400C                     ENDCS
0014.00 ML400C*
0015.00      C*
0016.00      C* INITIALIZE THE DATA FIELDS
0017.00      C*
0018.00      C                     TIME           TIMDAT 120       TIME AND DATE
0019.00      C                     MOVE TIMDAT    DATE    60       SYSTEM DATE
0020.00      C                     MOVELTIMDAT    TIME    60       SYSTEM TIME
0021.00      C*
0022.00      C* PRINT HEADINGS
0023.00      C*
0024.00      C                     EXCPTHEADER
0025.00      C*
0026.00      C* SET THE FILE
0027.00      C*
0028.00      C           *LOVAL    SETLLPHYSICAL
0029.00      C*
0030.00      C           *INLR     DOUEQ'1'
0031.00      C*
0032.00      C* READ THE FILE UNTIL END OF DATA
0033.00      C*
0034.00      C                     READ PHYSICAL                LR
0035.00      C           *INLR     IFEQ '0'
0036.00      C*
0037.00      C* TEST FOR OVERFLOW
0038.00      C*
0039.00      C           *INOF     IFEQ '1'
0040.00      C                     EXCPTHEADER
0041.00      C                     SETOF                    OF
0042.00      C                     END
0043.00      C*
0044.00      C* PRINT THE DETAIL RECORDS
0045.00      C*
0046.00      C                     EXCPTDETAIL
0047.00      C*
0048.00      C                     END
0049.00      C                     END
0050.00 ML400C*****************************************************************
0051.00 ML400C* Load The Message Text For Internal Printer Files              *
0052.00 ML400C*****************************************************************
0053.00 ML400C           ATHLNG    BEGSR
0054.00 ML400C*
0055.00 ML400C* Call Program To Retrieve The Message Text
0056.00 ML400C*-------------------------
0057.00 ML400C                     DO   004       I#      30
0058.00 ML400C                     CALL 'CTNLSRTV'
0059.00 ML400C                     PARM           I#1,I#
0060.00 ML400C                     PARM           I#2,I#
0061.00 ML400C                     FREE 'CTNLSRTV'
0062.00 ML400C                     ENDDO
0063.00 ML400C*
0064.00 ML400C                     MOVELI#2,001   I#0001 17
0065.00 ML400C                     MOVELI#2,002   I#0002 27
0066.00 ML400C                     MOVELI#2,003   I#0003 14
0067.00 ML400C                     MOVELI#2,004   I#0004 12
0068.00 ML400C*
0069.00 ML400C                     DO   002       I#      30
0070.00 ML400C                     MOVELOTH,I#    I#ID    7
0071.00 ML400C                     CALL 'CTNLSRTV'
0072.00 ML400C                     PARM           I#ID
0073.00 ML400C                     PARM           I#TXT  80
0074.00 ML400C                     FREE 'CTNLSRTV'
0075.00 ML400C                     MOVELI#TXT     OTH,I#
0076.00 ML400C                     ENDDO
0077.00 ML400C*
0078.00 ML400C                     DO   003       I#      30
0079.00 ML400C                     MOVELMSG,I#    I#ID    7
```

After Conversion continued.

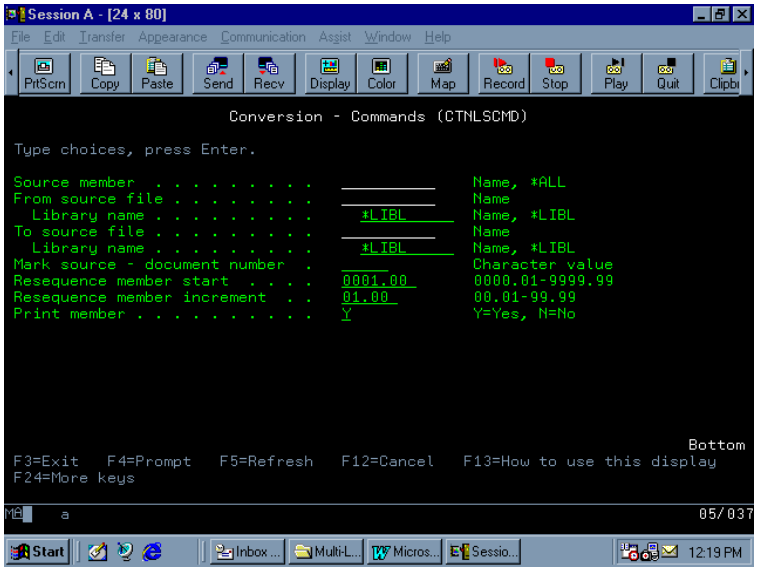
```
0080.00 ML400C                    CALL 'CTNLSRTV'
0081.00 ML400C                    PARM           I#ID
0082.00 ML400C                    PARM           I#TXT  80
0083.00 ML400C                    FREE 'CTNLSRTV'
0084.00 ML400C                    MOVELI#TXT     MSG,I#
0085.00 ML400C                    ENDDO
0086.00 ML400C*
0087.00 ML400C                    MOVE 'Y'       I#FIRP  1
0088.00 ML400C*
0089.00 ML400C                    ENDSR
0090.00       OQSYSPRT E  101          HEADER
0091.00 ML400O*                                20 'Multi-Lingual/400'
0092.00 ML400O                         I#0001    20
0093.00       OQSYSPRT E  2            HEADER
0094.00       O                        UDATE Y    8
0095.00       O                        TIME      17 '  :  :  '
0096.00 ML400O*                                45 'Company Master File'
0097.00 ML400O*                                   ' Listing'
0098.00 ML400O                         I#0002  0053
0099.00       OQSYSPRT E  1            HEADER
0100.00 ML400O*                                14 'Company Number'
0101.00 ML400O                         I#0003    14
0102.00 ML400O*                                29 'Company Name'
0103.00 ML400O                         I#0004    29
0104.00       OQSYSPRT E  1            DETAIL
0105.00       O                        CO         3
0106.00       O                        CONAME    44
0107.00       OQSYSPRT E  1            DETAIL
0108.00       O                        TABNAM    10
0109.00       O                        TABDSC    44
0110.00       OQSYSPRT E  1            DETAIL
0111.00       O                        OTH      132
0112.00       OQSYSPRT E  1            DETAIL
0113.00       O                        MSG      132
0114.00 ** OTH
0115.00 ATH0049
0116.00 ATH0050
0117.00 ** TABNAM
0118.00 ERROR
0119.00 ERROR 01
0120.00 ERROR 02
0121.00 ** MSG
0122.00 ATH0051
0123.00 ATH0052
0124.00 ** ML400
0125.00 ATH0045
0126.00 ATH0046
0127.00 ATH0047
0128.00 ATH0048
        ****************** End of data ****************************************
```

Chapter 12
Source Code Conversion for Commands

The conversion of Commands replaces all prompt literals without altering the functionality of the program.

Step 1: Convert Commands.

On the command line enter (6) from the Conversion Menu to Convert Commands. The following screen will be displayed:



Source member
Enter the Source Member Name which is to be converted or enter *ALL to convert all members within the source file and library.

From source file
Enter the Source File Name from which this source member will be selected.

Library Name
Enter the Library Name from which the source file will be selected.

To Source File
Enter the name of the Source File selected to hold the converted source code.

Library Name
Enter the library name created to hold the converted source code.

Mark source – document number
To be completed if you would like to mark or indicate any changes made to the source code. This document number will be placed in positions 1-9 or the best fit (Starting at the left to right most positions) of the source line of code being altered.

NOTE: In all examples of source code conversion within this document changes have been marked with ML400.

Resequence member start
Type the sequence number of the line where re-sequencing should start. The range must lie between 0000.01 and 9999.99.

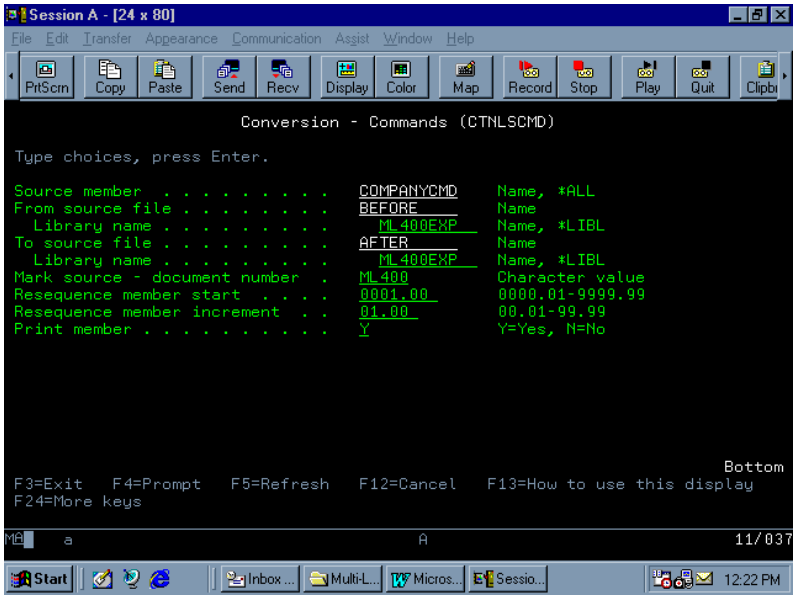
Resequence member increment
Type a value between 0.01 and 99.99 that will be used to increment the sequence numbers in your member.

Step 2: Press Enter to process the Source Code Conversion.

Step 3: To complete the conversion process these files must be recompiled.

Example of Source Code Conversion for Commands:

During the Command Conversion Multi-Lingual/400 replaces all prompt literals and inserts the Message Id into the source code.



Before Conversion

```
Columns . . . :    1  80                                  Browse
 SEU==>
 FMT **  ...+... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+... 8
       ********** Beginning of data ***********************************************
0001.00      /*************************************************************/
0002.00      /*    Multi-Lingual/400 CMD Conversion                       */
0003.00      /*************************************************************/
0004.00      /*                                                           */
0005.00              CMD        PROMPT('Conversion - Display Files')
0006.00
0007.00              PARM       KWD(MBR) TYPE(*NAME) LEN(10) SPCVAL((*ALL)) +
0008.00                           MIN(1) PROMPT('Source member')
0009.00
0010.00              PARM       KWD(FMSRC) TYPE(QUAL1) MIN(1) +
0011.00                           PROMPT('From source file')
0012.00
0013.00              PARM       KWD(TOSRC) TYPE(QUAL2) MIN(1) +
0014.00                           PROMPT('To source file')
0015.00
0016.00              PARM       KWD(AUD) TYPE(*CHAR) LEN(5) PROMPT('Mark +
0017.00                           source - document number')
0018.00
0019.00              PARM       KWD(STR) TYPE(*DEC) LEN(6 2) RSTD(*NO) +
0020.00                           DFT(0001.00) RANGE(0000.01 9999.99) +
0021.00                           PROMPT('Resequence member start')
0022.00
0023.00              PARM       KWD(INC) TYPE(*DEC) LEN(4 2) RSTD(*NO) +
0024.00                           DFT(01.00) RANGE(00.01 99.99) +
```

After Conversion

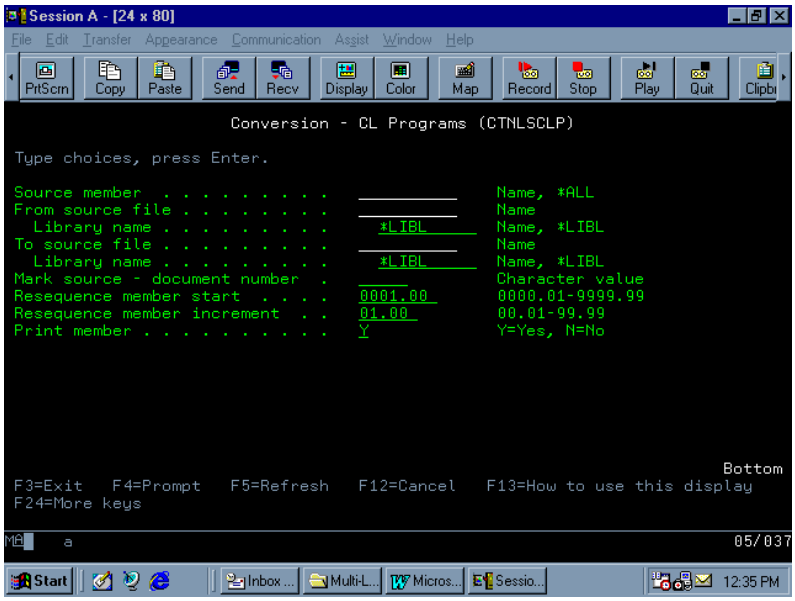
```
Columns . . . :    1  80                                  Browse
 SEU==>
 FMT **  ...+... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+... 8
       ********** Beginning of data ***********************************************
0001.00      /*************************************************************/
0002.00      /*    Multi-Lingual/400 CMD Conversion                       */
0003.00      /*************************************************************/
0004.00      /*                                                           */
0005.00 /*ML400*/    CMD        PROMPT(ATH0022)
0006.00
0007.00              PARM       KWD(MBR) TYPE(*NAME) LEN(10) SPCVAL((*ALL)) +
0008.00 /*ML400*/                MIN(1) PROMPT(ATH0023)
0009.00
0010.00              PARM       KWD(FMSRC) TYPE(QUAL1) MIN(1) +
0011.00 /*ML400*/                PROMPT(ATH0024)
0012.00
0013.00              PARM       KWD(TOSRC) TYPE(QUAL2) MIN(1) +
0014.00 /*ML400*/                PROMPT(ATH0025)
0015.00
0016.00              PARM       KWD(AUD) TYPE(*CHAR) LEN(5) +
0017.00 /*ML400*/                PROMPT(ATH0026)
0018.00
0019.00              PARM       KWD(STR) TYPE(*DEC) LEN(6 2) RSTD(*NO) +
0020.00                           DFT(0001.00) RANGE(0000.01 9999.99) +
0021.00 /*ML400*/                PROMPT(ATH0027)
0022.00
0023.00              PARM       KWD(INC) TYPE(*DEC) LEN(4 2) RSTD(*NO) +
0024.00                           DFT(01.00) RANGE(00.01 99.99) +
```

Chapter 13
Source Code Conversion for Control Language Programs

The conversion of the Control Language Programs replaces all program messages and user messages with Message Id's in the source code.

Step 1: Convert Control Language Programs.

On the command line enter (7) from the Conversion Menu to Convert Control Language Programs. The following screen will be displayed:



Source member

Enter the Source Member Name which is to be converted or enter *ALL to convert all members within the source file and library.

From source file

Enter the Source File Name from which this source member will be selected.

Library Name

Enter the Library Name from which the source file will be selected.

To Source File

Enter the name of the Source File selected to hold the converted source code.

Library Name

Enter the Library Name created to hold the converted source code.

Mark source – document number

To be completed if you would like to mark or indicate any changes made to the source code. This document number will be placed in positions 1-9 or the best fit (Starting at the left to right most positions) of the source line of code being altered.

NOTE: In all examples of source code conversion within this document changes have been marked with ML400.

Resequence member start

Type the sequence number of the line where re-sequencing should start. The range must lie between 0000.01 and 9999.99.

Resequence member increment

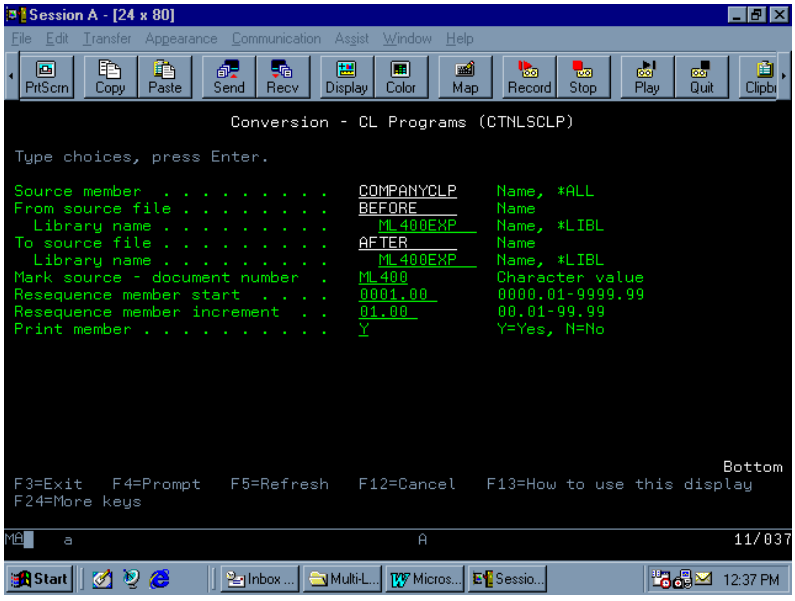
Type a value between 0.01 and 99.99 that will be used to increment the sequence numbers in your member.

Step 2: Press Enter to process the Source Code Conversion.

Step 3: To complete the conversion process these files must be recompiled.

Example of Source Code Conversion for Control Language Programs:

During the Control Language Programs conversion Multi-Lingual/400 replaces all SNDPGMMSG and SNDUSRMSG commands containing message text and inserts the Message Id into the source code.



Before Conversion

```
Columns . . . :    1  80                                  Browse
 SEU==>
 FMT **  ...+... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+... 8
       *************** Beginning of data ***************************************************
0001.00      /*************************************************************/
0002.00      /*    Multi-Lingual/400 CLP Conversion                       */
0003.00      /*************************************************************/
0004.00      /*                                                           */
0005.00              PGM
0006.00
0007.00              SNDMSG     MSG('This command does not use message +
0008.00                           ids') TOUSR(*SYSOPR)
0009.00
0010.00              SNDPGMMSG  MSG('Test the send user message text +
0011.00                           conversion')
0012.00
0013.00              SNDUSRMSG  MSG('Test the send user message text +
0014.00                           conversion')
0015.00
0016.00              SNDUSRMSG  MSG('test the message text +
0017.00              TEST LINE NUMBER 2 +
0018.00              TEST LINE NUMBER 3 +
0019.00              TEST LINE NUMBER 4')
0020.00
0021.00              SNDBRKMSG  MSG('not this one') TOMSGQ(*ALLWS)
0022.00
0023.00  ENDPGM:     ENDPGM
       ****************** End of data ****************************************************
```

After Conversion

```
Columns . . . :    1  80                                  Browse
 SEU==>
 FMT **  ...+... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+... 8
       *************** Beginning of data ***************************************************
0001.00      /*************************************************************/
0002.00      /*    Multi-Lingual/400 CLP Conversion                       */
0003.00      /*************************************************************/
0004.00      /*                                                           */
0005.00              PGM
0006.00
0007.00              SNDMSG     MSG('This command does not use message +
0008.00                           ids') TOUSR(*SYSOPR)
0009.00
0010.00              SNDPGMMSG  +
0011.00 /*ML400*/                MSGID(ATO0173) MSGF(FTLNGMSG)
0012.00
0013.00              SNDUSRMSG  +
0014.00 /*ML400*/                MSGID(ATO0173) MSGF(FTLNGMSG)
0015.00
0016.00              SNDUSRMSG  +
0017.00              +
0018.00              +
0019.00 /*ML400*/    MSGID(ATO0174) MSGF(FTLNGMSG)
0020.00
0021.00              SNDBRKMSG  MSG('not this one') TOMSGQ(*ALLWS)
0022.00
0023.00  ENDPGM:     ENDPGM
       ****************** End of data ****************************************************
```

Chapter 14
Maintaining Your Dictionary

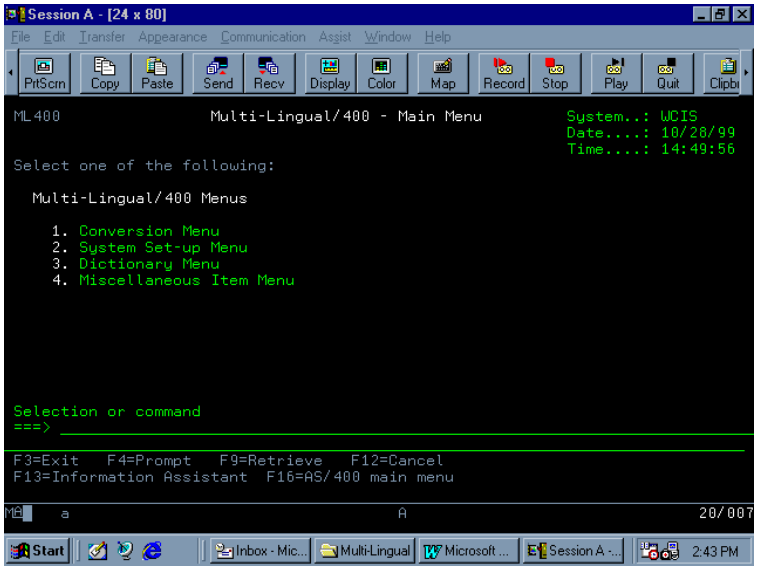
Chapter fourteen covers the use of the Language Dictionary. Earlier during the conversion process Message Id's were assigned to every literal on your system. Currently you have one Message Id for each language specified in the Language Values Master File multiplied by the number of literals created. All sets are currently displayed in your dictionary, this section explains how to view and edit the dictionary.

The following formula is used to calculate the total number of records in the dictionary: the number of literals multiplied by the number of languages specified in the language value field added to the sum of the literals for the (GENERATED) field.

This method is primarily used to make changes or corrections to an existing translated dictionary. This file may be maintained and updated at any time. Refer to your translator for text validation.

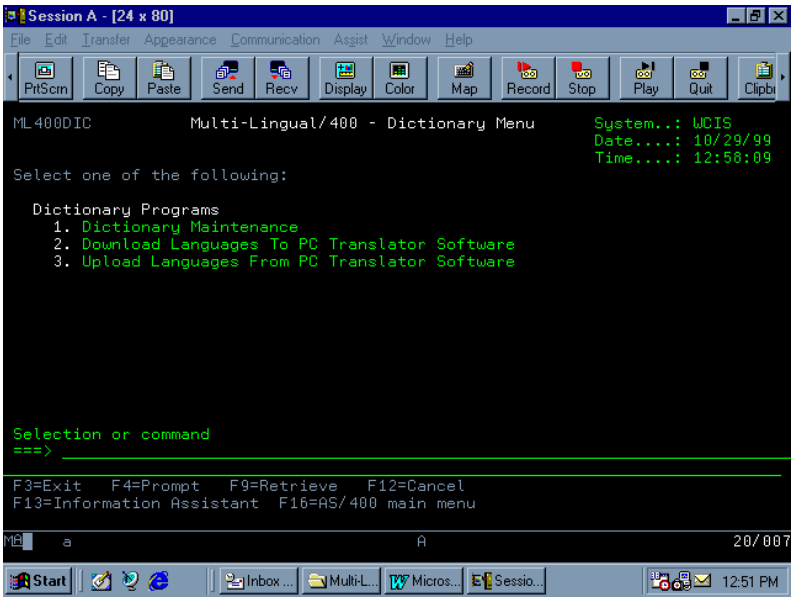
Step 1: Sign on to the Multi-Lingual/400 System.

The following screen will be displayed:



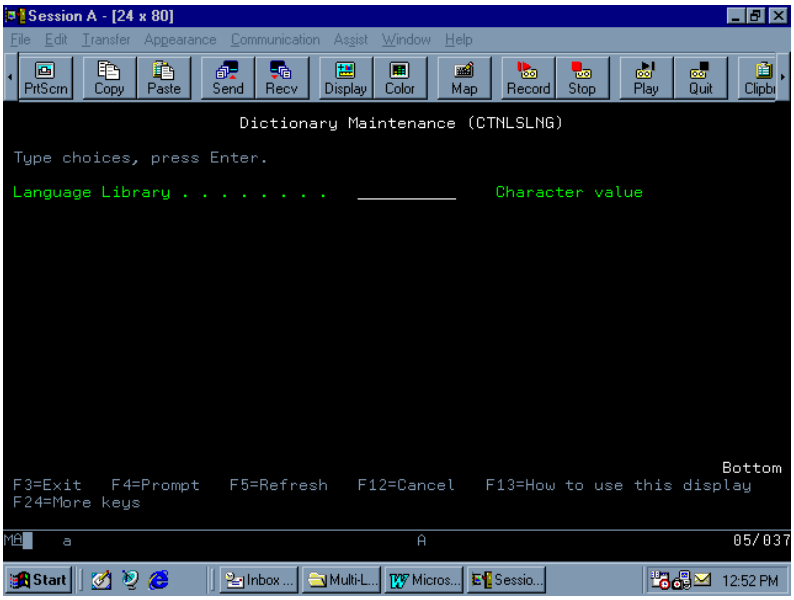
Step 2: Display the Dictionary Menu.

On the command line of the Multi-Lingual/400 Main Menu select option (3) for the Dictionary Menu. The following screen will be displayed:



Step 3: Maintain the Dictionary.

On the command line of the Dictionary Menu enter a (1) to begin the Dictionary Maintenance. The following screen will be displayed:

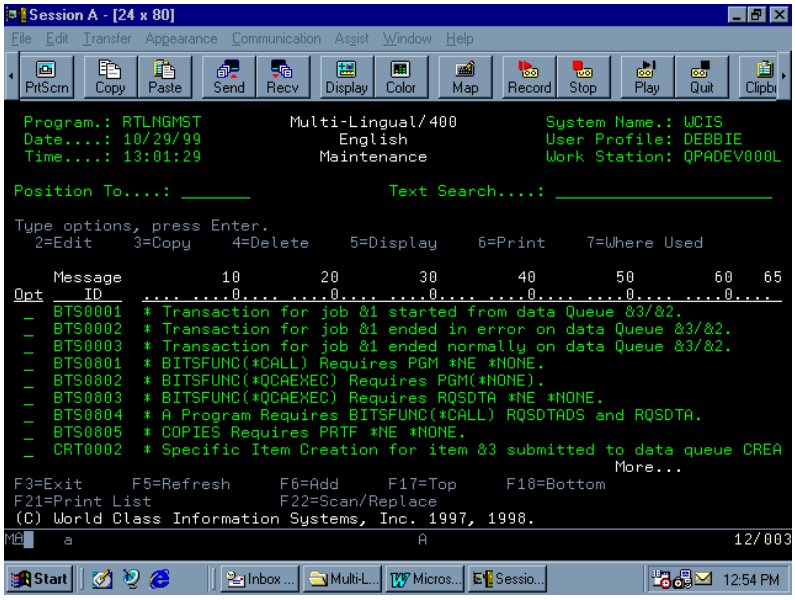


NOTE: The dictionary records created for the lookup procedures are stored in the Language Library, "GENERATED". These messages make up the master copy of the dictionary.

NOTE: If you want to delete a Message Id for all languages this can be done individually in each language library or in the "GENERATED" language library. If you chose to delete it from the GENERATED library, you will delete the Message Id in ***ALL*** language libraries.

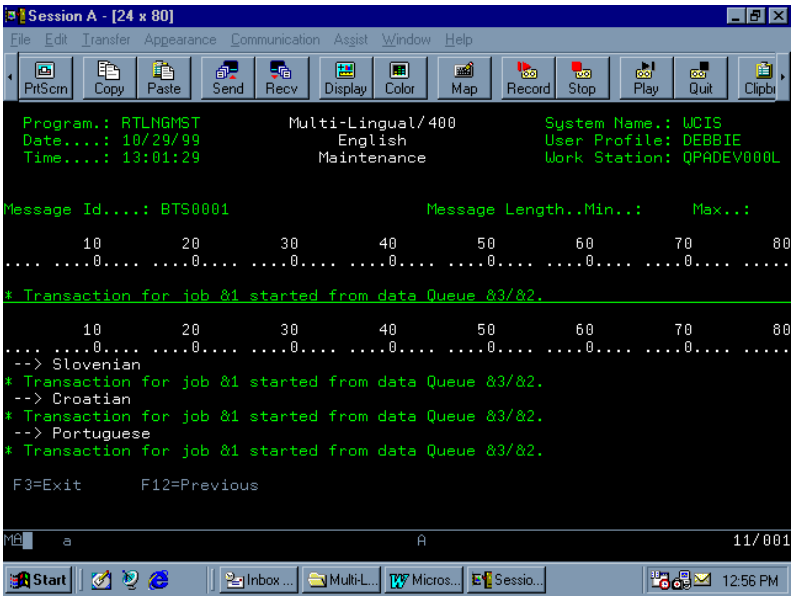
Step 4: Edit the Language Library.

Enter the Language Library name for the text to be maintained. Below is an example of the Language Master File Screen. The Language Library entered is QSYS2924 (English).



Step 5: Edit Message Id Text.

On the option line enter a (2) for editing of the Message Id Text. The following screen will be displayed:



Message ID

The Message Text field displays the text for the indicated Message Id in the language entered in the Language Library Field.

Message Length

The Message Length displays two values, the Minimum Length of the field indicated and the Maximum Length of the field indicated.

Additional Languages

The Additional Languages Field displays the text for all other Language Libraries attached to the system.

Step 6: Make changes to the Message Text.

Complete changes to the Message Text and press enter. Press F3=Exit, to return to the Dictionary Menu.

Chapter 15
Using The PC Translator

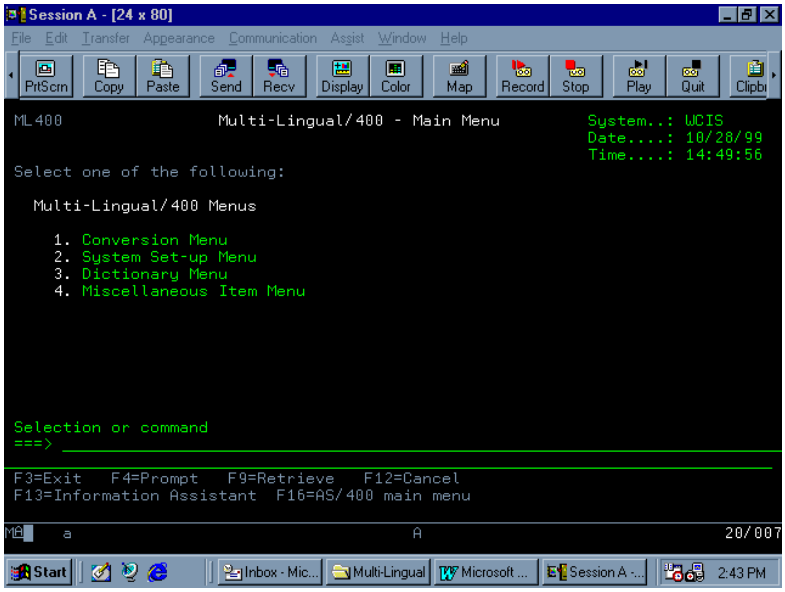
To ensure a smooth conversion of all the source code we have created the following two options to aide in the translation process:

1. Download Languages To PC Translator Software
2. Upload Languages From PC Translator Software

These options may be used with your choice of translation software. This chapter will explain the use of these two options and the steps taken to use them effectively.

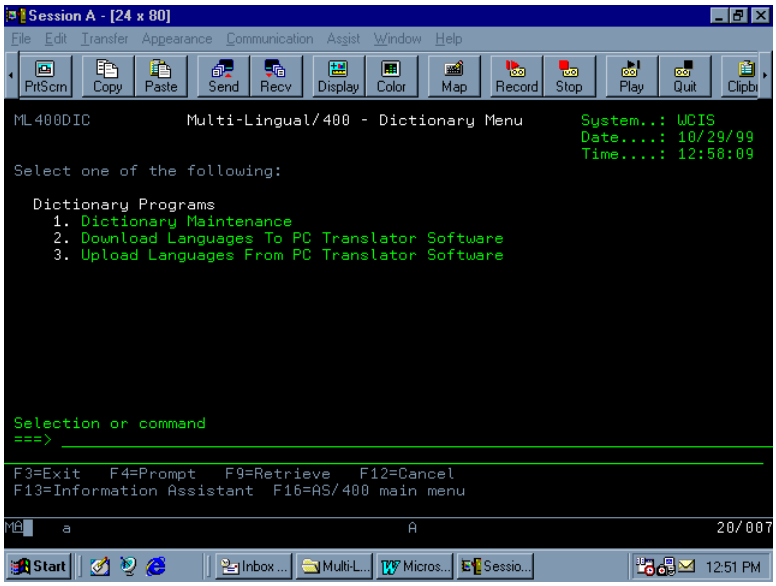
Step 1: Sign onto the Multi-Lingual/400 System.

The following screen will be displayed:



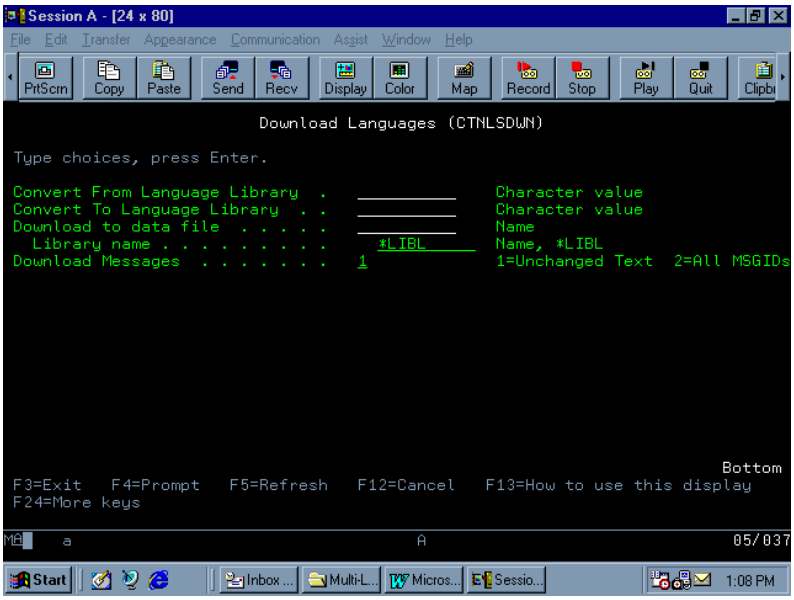
Step 2: Select the Dictionary Menu.

On the command line enter a (3) to view the Dictionary Menu Screen. The following screen will be displayed:



Step 3: Display the Download Languages To PC Translator Software.

On the command line enter option (2) for the Download Languages to PC Translator Software Screen. The following screen will be displayed:



NOTE: Each field must be completed to begin the download to the PC translator.

Convert From Language Library
Enter the current Language Library Name for conversion.

Convert To Language Library
Enter the Language Library Name you will be converting to.

Download to data file
Enter the name of the data file to be used. This must be a valid IBM file name and cannot previously have existed in the specified library.

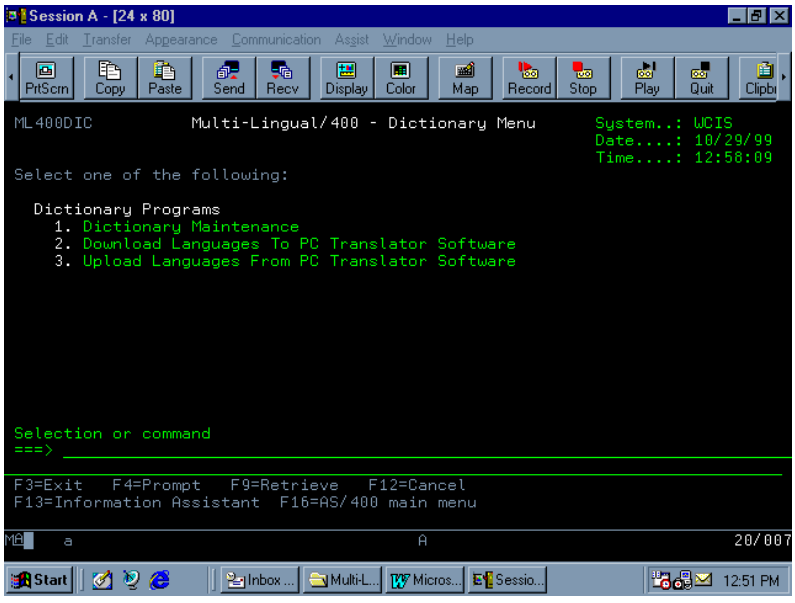
Library Name
Enter the name of the library where this file will reside. This must be a valid IBM library and must exist on the AS/400.

Download Messages
Valid options are: (1) Unchanged Text or (2) ALL MSGIDs. The default is set To (1) Unchanged Text.

(1) Unchanged Text – Unchanged Text will download only those MSGIDS that contain the same text
(2) ALL MSGIDs – ALL MSGIDs will download all MSGIDs, even text that may have been previously translated

Step 4: Download has been completed.

The Dictionary Menu will be displayed with the following message once the download has been completed:

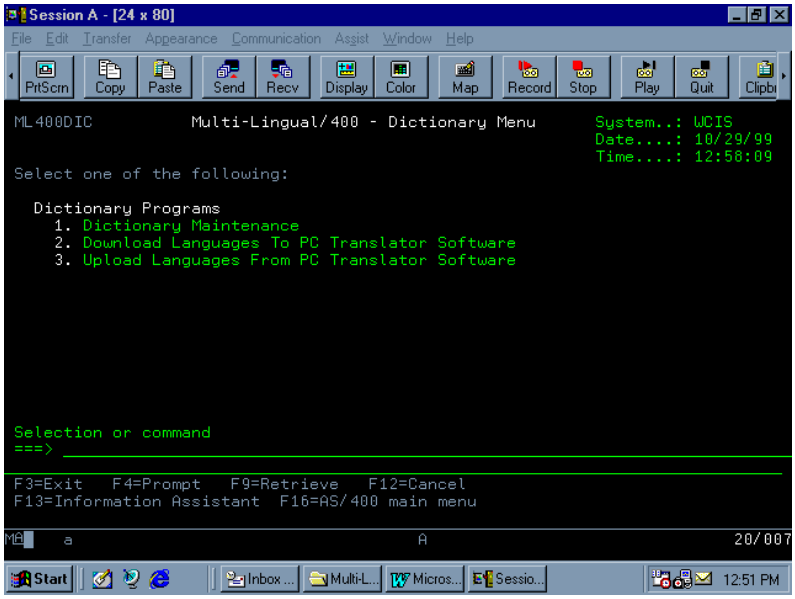


Step 5: Download the file to the PC.

The download file can be transferred using Client/Access or any other protocol to the AS/400.

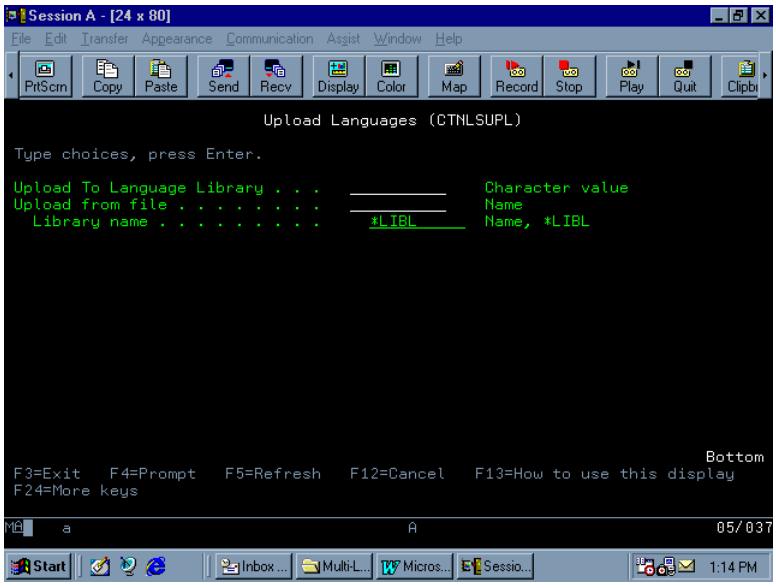
Step 6: Display the Upload Languages From PC Translator Software Option.

On the command line enter (3) to Upload Languages From PC Translator Software.



Step 7: Begin the Language Upload.

Enter the required fields to begin the upload process. Each field must be completed to begin the upload to the AS/400 system.



Upload To Language Library

Indicates the name of the Language Library where the data is to be uploaded.

Upload from file
Indicates the file name being uploaded.

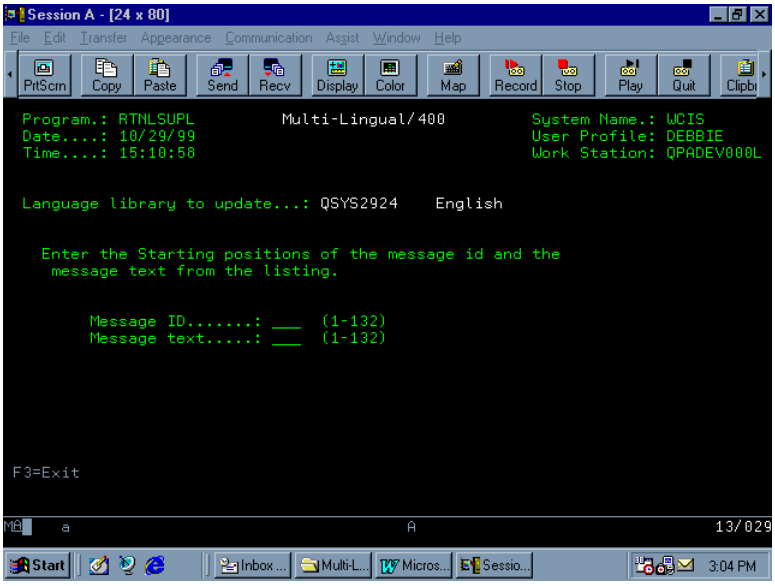
Library name
Indicates the name of the library where the data will be stored.

Step 8: Automatic Print of the Upload Languages From PC Translator Listing.

Follow normal operating procedures to print listing RTNLSUPL. This document will list the Message Id's and the Message Text including the starting positions of the Message Id's and the Message Text.

Step 9: Enter the Starting positions.

Enter the starting positions of the Message Id and MessageText from the Automatic Print of the Upload Languages From PC Translator Listing printed in Step 8.



Step 10: Complete the Upload process.

The Multi-Lingual/400 utility will return to the Dictionary Menu Screen.

Chapter 16
Set-up Of Initial User Library List

Chapter sixteen will cover the initial setup of the user library list. Each language specified within the language values field enables you to run your business applications in that language format.

This program will determine the Country Code from your AS/400 user profile. It is then passed to your job and adds the language library to your user library list.

Step 1: Call Multi-Lingual/400 Language Start up Program.

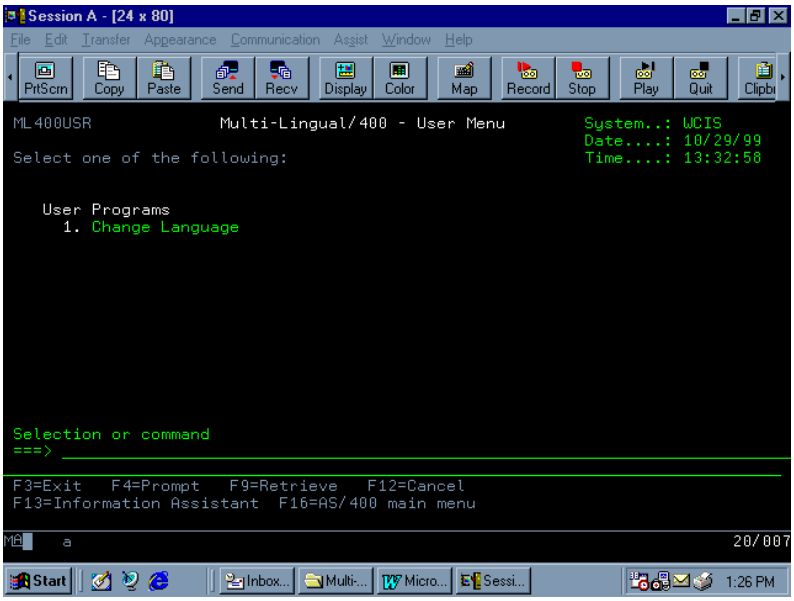
From your initial start-up program call, CTNLSCUR, this will complete the process.

Chapter 17
Change your Language

Chapter seventeen explains how to change your default language after your initial sign-on. This can be done at any time and will not alter your data.

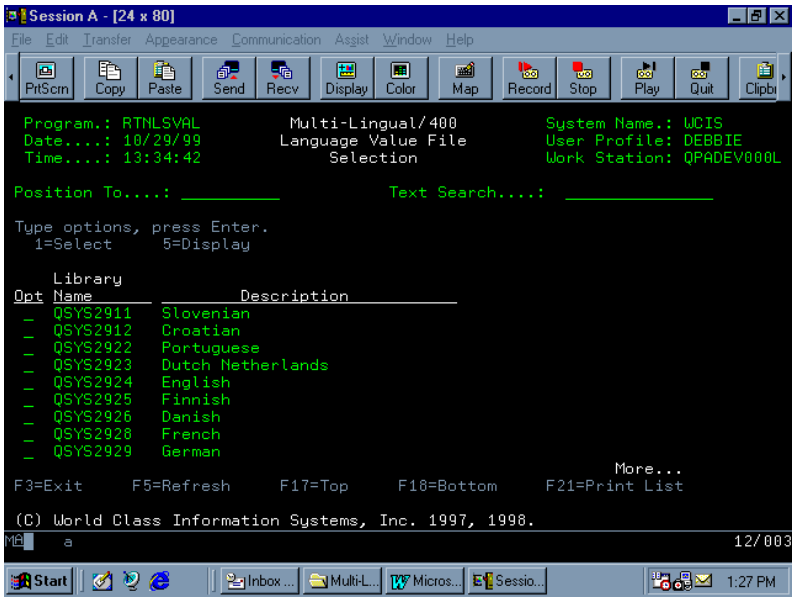
Step 1: Call Multi-Lingual/400 User Menu.

Enter GO ML400USR. The following screen will be displayed:



Step 2: Display the List of Languages for Selection.

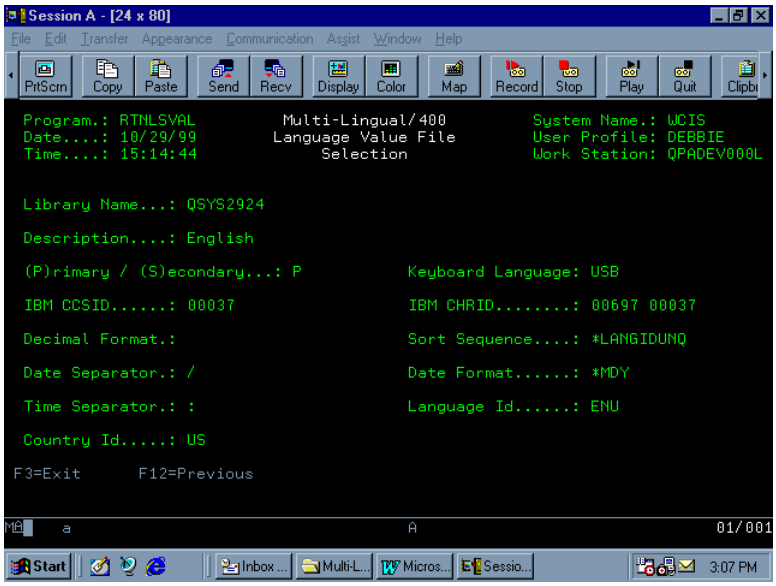
On the command line enter option (1) for the Language selection. The following screen will be displayed:



Step 3: Select your Language.

On the option line enter option (1) to select your Language.

NOTE: Once the selection of a Language is complete the current job will change to the attributes specified in the Language Values File.



Chapter 18
Convert Dictionary (Upper & Lower Case)

This chapter explains the usage of the Convert Dictionary Upper & Lower Case option. The user can determine the manor in which they want their dictionary to be displayed, either all upper or all lower case text.

Step 1: Sign on to the AS/400.

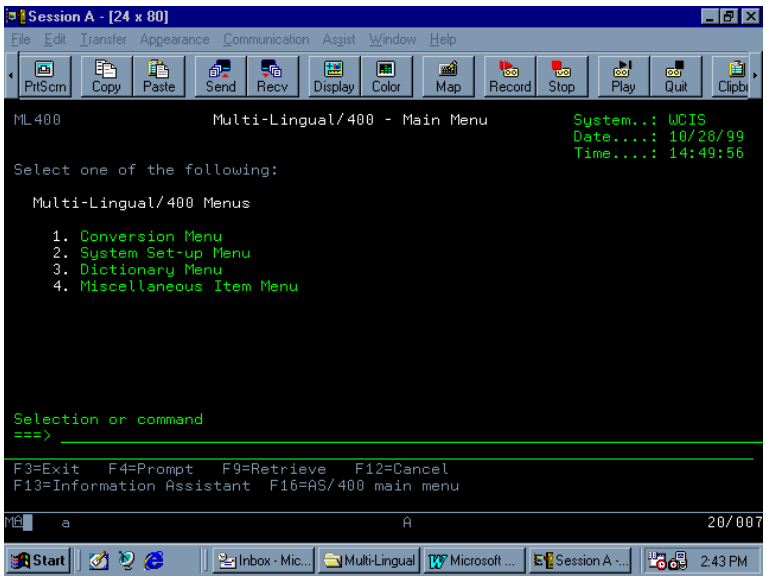
The Main Menu Screen will be displayed.

Step 2: Start Multi-Lingual/400.

On the command line enter:

GO ML400

The Multi-Lingual/400 menu selection screen will be displayed as demonstrated below:

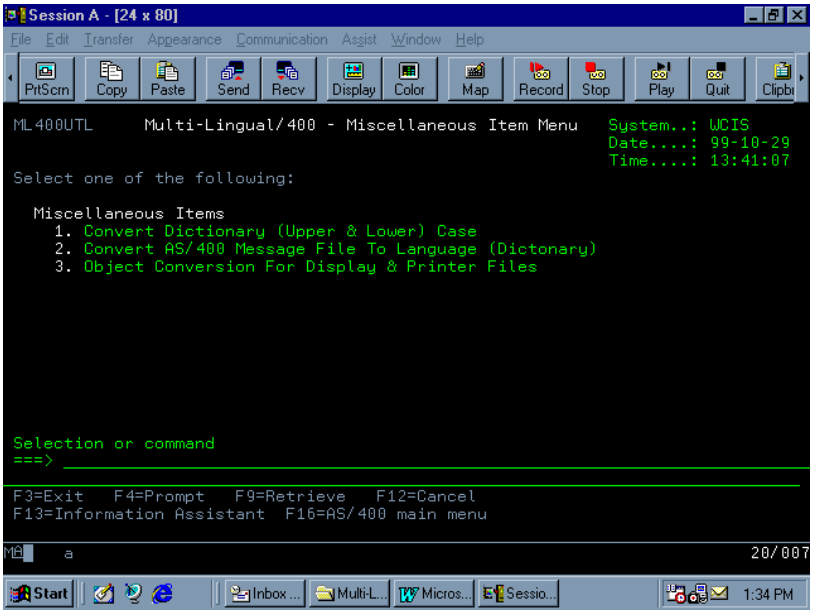


Step 3: Select Miscellaneous Menu.

On the command line enter a (4) to select Miscellaneous Menu.

Step 4: Display the Miscellaneous Menu Screen.

The following screen will be displayed:

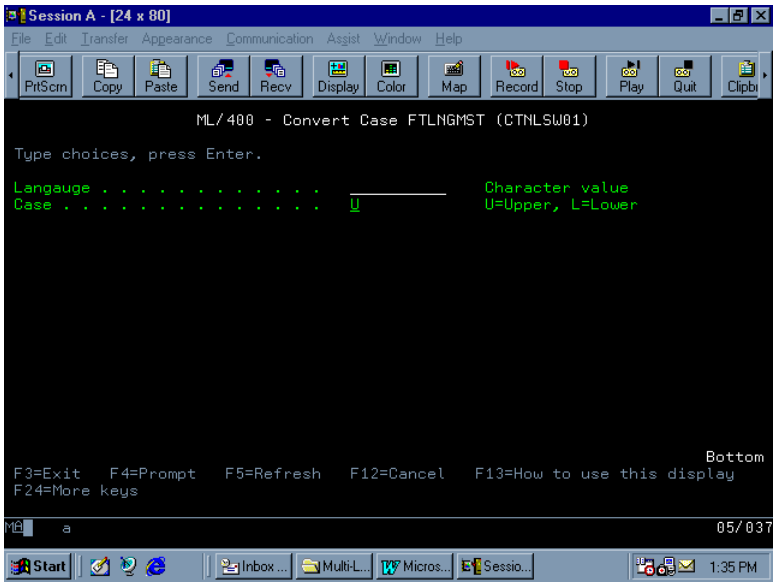


Step 5: Select Convert Dictionary (Upper & Lower) Case.

On the command line enter (1) to change the Dictionary Case.

Step 6: Convert Case FTLNGMST.

The following screen will be displayed:



The following is a brief description of the fields required to change the dictionary case from upper to lower case text.

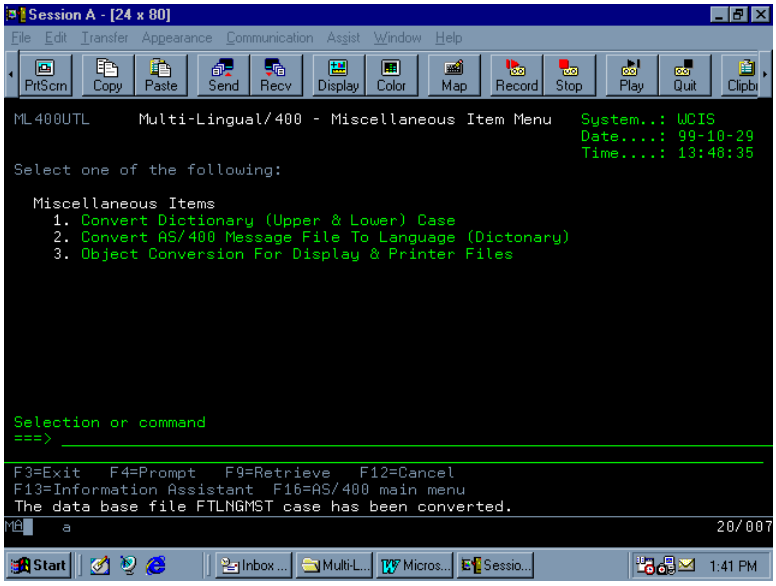
Language
Enter the valid IBM source library.

Case
Valid entries are: U for upper case
L for lower case

NOTE: The default is set for Upper case.

Step 7: Verify conversion is complete.

The message, 'The data base file FTLNGMST case has been converted,' is displayed at the bottom of the conversion screen as demonstrated below:



Step 8: F3=Exit and return to the Main Menu.

Enter a (3) Dictionary Menu on the command line of the Main Menu.

Step 9: Display Dictionary Maintenance.

Enter a (1) Dictionary Maintenance on the command line to view the dictionary.

Step 10: Display the converted Dictionary.

Enter the Language Library to be viewed.

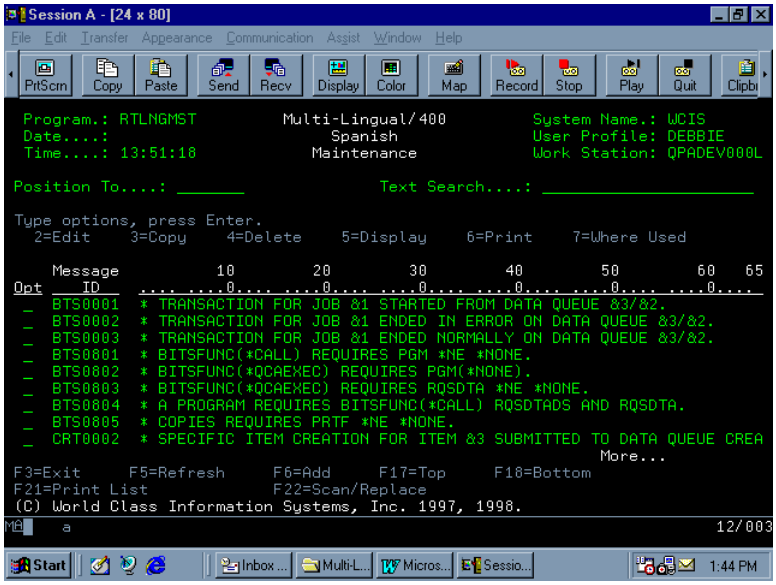
Step 11: View the Message Id and Message Text.

Verify the Message text is in the case specified during conversion.

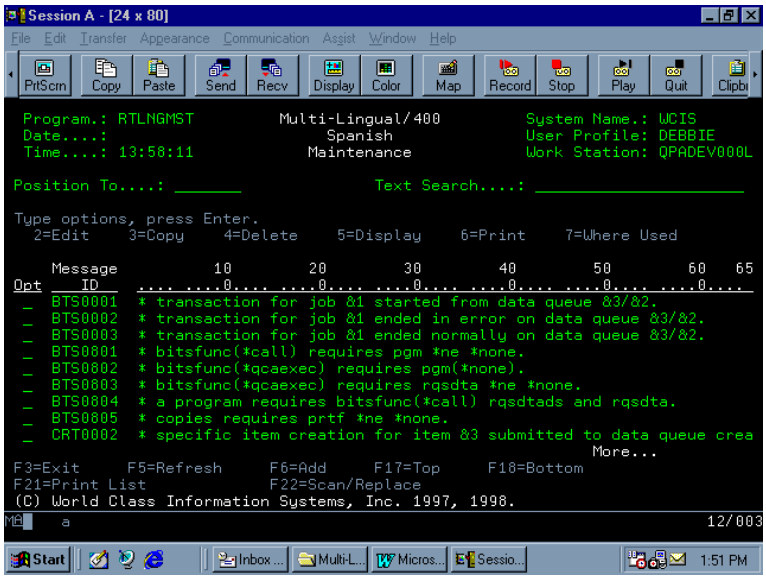
Step 12: F3=Exit.

Example of a Dictionary Case Conversion

Before conversion



After conversion



Chapter 19
Convert AS/400 Message File To Language (Dictionary)

Chapter nineteen details the conversion of message files in your dictionary. This function will convert all literal parts of the dictionary.

Step 1: Sign on to the AS/400.

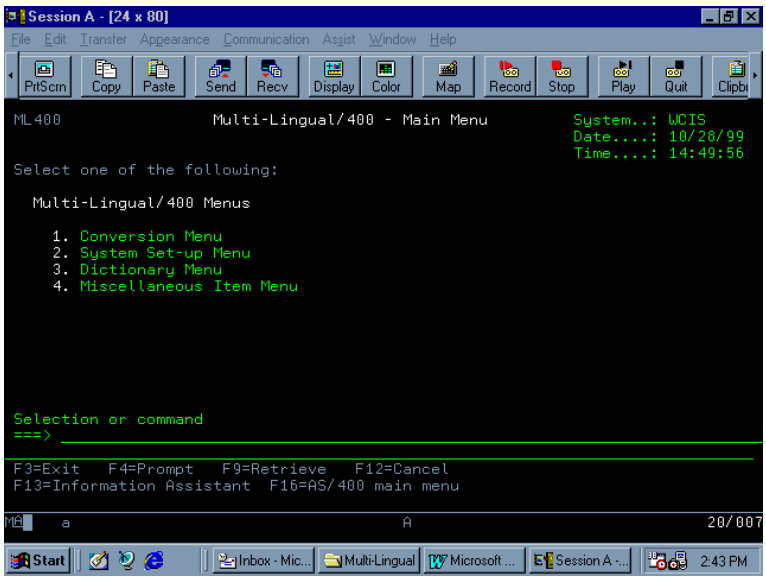
The Main Menu Screen will be displayed.

Step 2: Start Multi-Lingual/400.

On the command line enter:

GO ML400

The Multi-Lingual/400 menu selection screen will be displayed as demonstrated below:

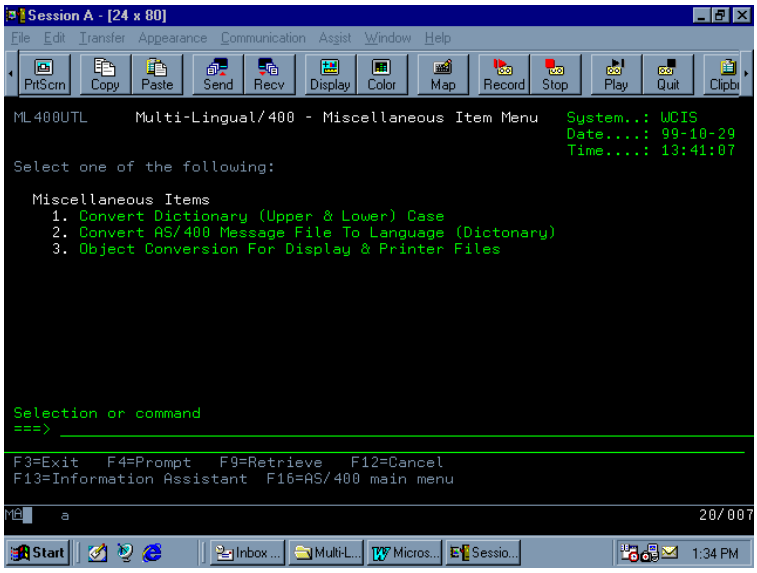


Step 3: Select Miscellaneous Menu.

On the command line enter a (4) to select Miscellaneous Menu.

Step 4: Display the Miscellaneous Menu Screen.

The following screen will be displayed:

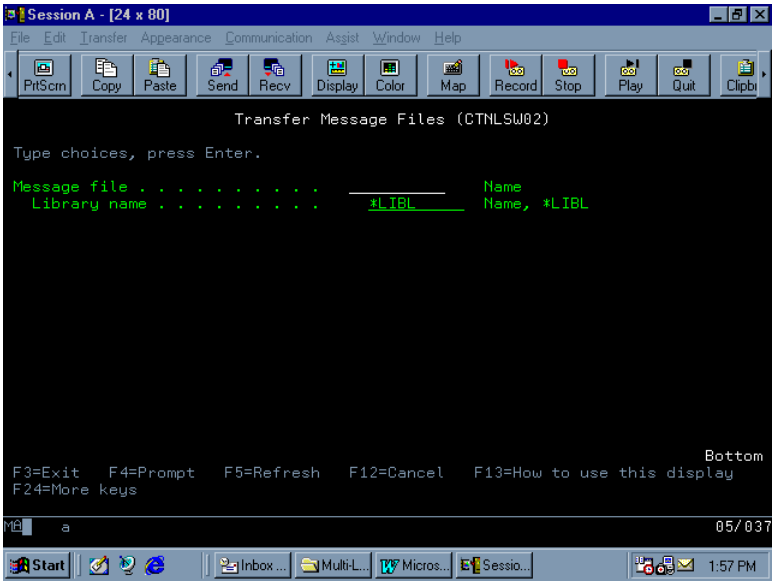


Step 5: Select Convert AS/400 Message File To Language (Dictionary).

On the command line enter a (2) to select Convert AS/400 Message File To Language (Dictionary).

Step 6: Convert the Message File.

The following screen will be displayed:



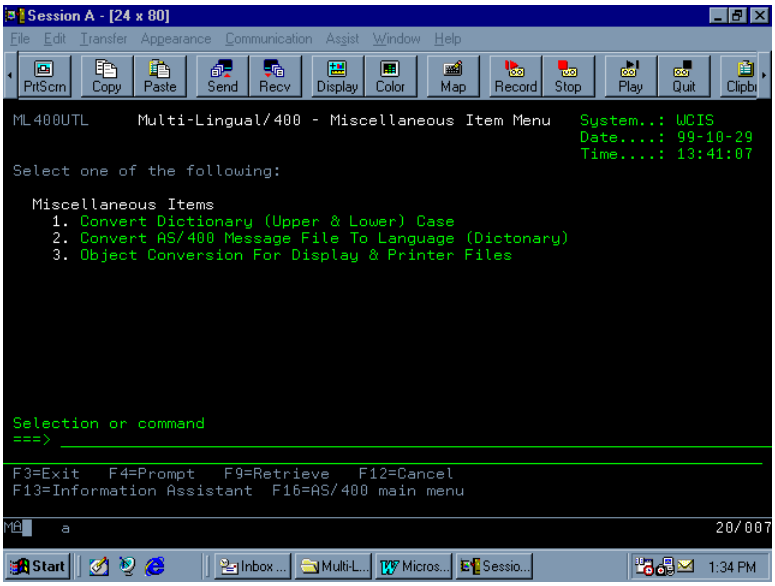
The following is a brief description of the fields required to convert the Message File to the Language (Dictionary).

Message File
Enter the Message File Name to be converted.

Library Name
Enter the Library Name from which the Message File will come.

Step 7: Verify conversion is complete.

The message, *'A number* of message descriptions converted.' is displayed at the bottom of the conversion screen:



Step 8: F3=Exit and return to the Main Menu.

Enter a (3) Dictionary Menu on the command line of the Main Menu.

Step 9: Display Dictionary Maintenance.

Enter a (1) Dictionary Maintenance on the command line to view the dictionary.

Step 10: Display the converted Dictionary.

Enter the Language Library to be viewed. This library will now contain Message Id's for the converted message file.

Step 11: F3=Exit

Chapter 20
Object Conversion For Display and Printer File

Chapter twenty explains how to perform the object conversion for display and printer files. The character data is changed from the device CHRID to the CCSID (coded character set identifier) of the job on display file input, and from the CCSID of the job to the device CHRID on display file output. In this section you will convert code pages by the CCSID identifier not by the default hex-decimal conversion.

Step 1: Sign on to the AS/400.

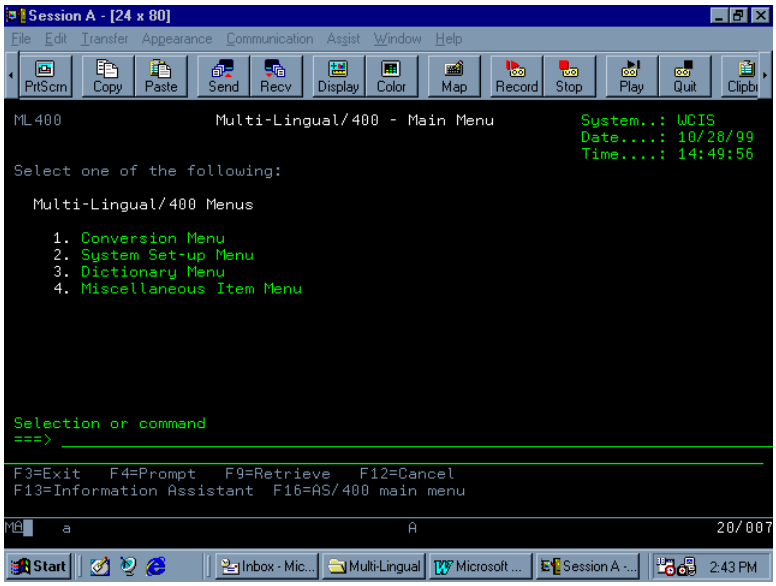
The Main Menu screen will be displayed.

Step 2: Start Multi-Lingual/400.

On the command line enter:

GO ML400

The Multi-Lingual/400 menu selection screen will be displayed as demonstrated below:

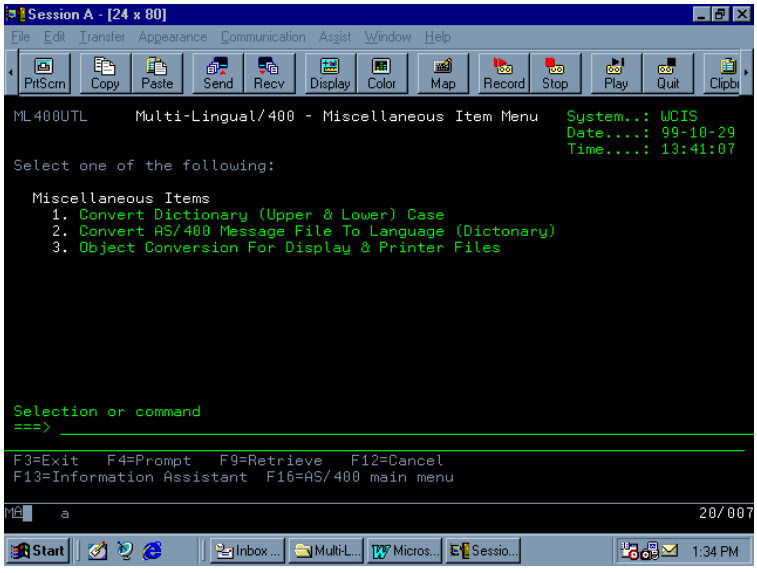


Step 3: Select Miscellaneous Menu.

On the command line enter a (4) to select Miscellaneous Menu.

Step 4: Display the Miscellaneous Menu Screen.

The following screen will be displayed:

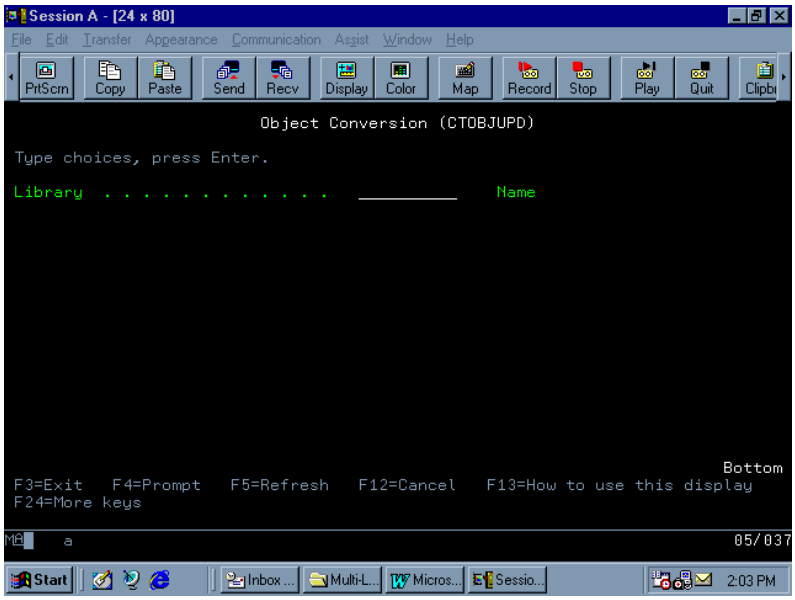


Step 5: Select Object Conversion.

Enter option (3) Object Conversion for Display & Printer Files on the command line.

Step 6: Display Object Conversion Screen.

The following screen will be displayed:



Step 7: Convert your library.

Enter the library to be converted. Once the conversion is complete the following message will be displayed:

FILE OBJECT IN LIBRARY *YOUR LIBRARY* CHANGED.

Note: This conversion tool will process the following commands.

1) **chgdsp (object) chrid (*jobccsid)**
2) **chgprtf (object) chrid (*jobccsid)**

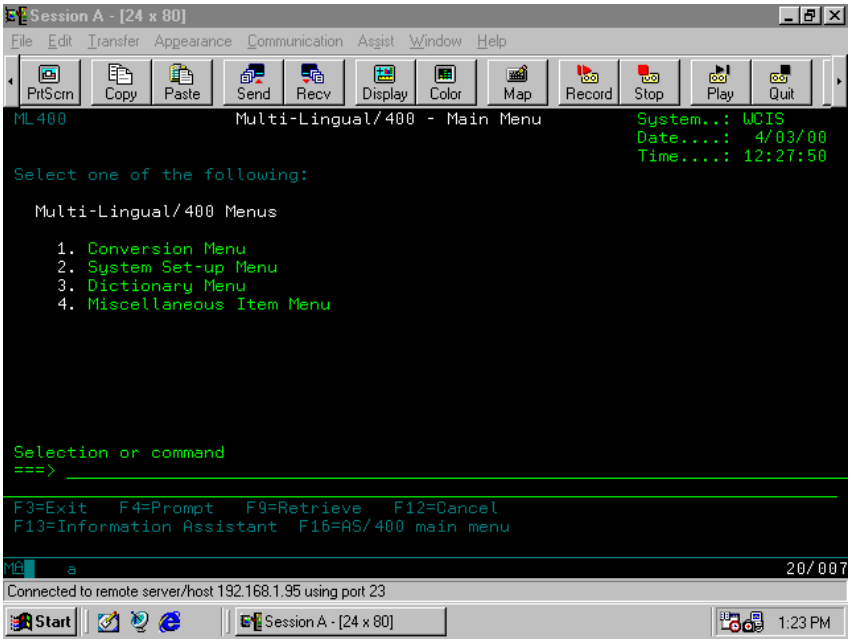
Step 8: F3=Exit.

Chapter 21
Source Code Distribution

The source code for the language selection function can be distributed for run time by calling the following program on the command line:

Step 1: Sign on to Multi-Lingual/400 with Programmer authority.

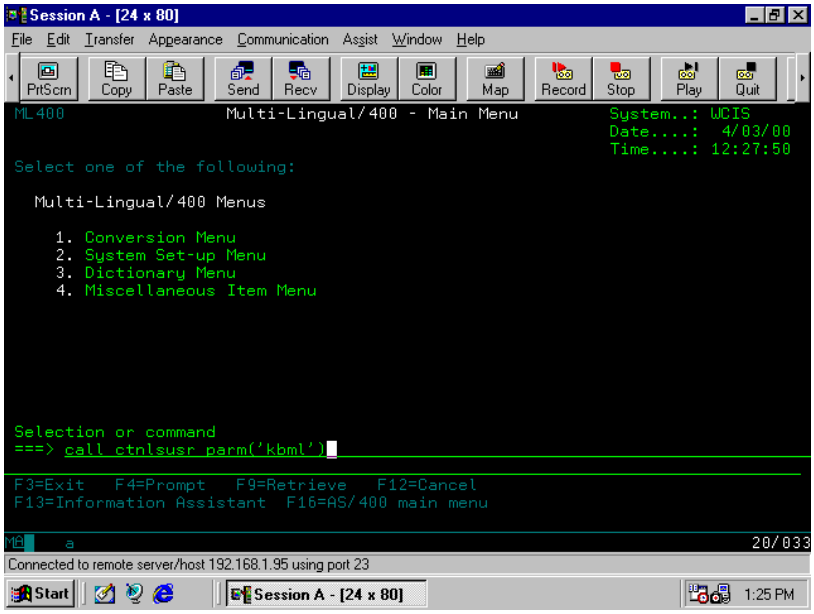
The following screen will be displayed:



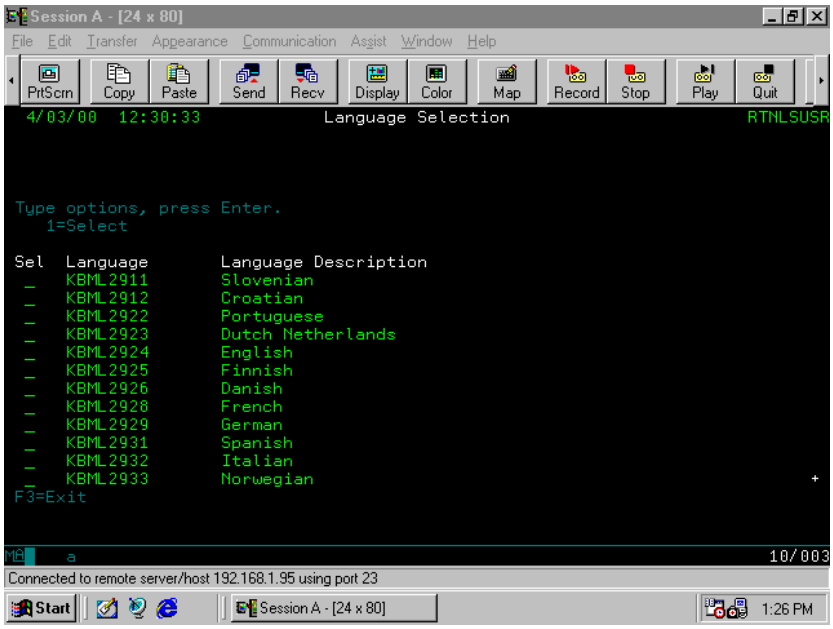
Step 2: Type the following command on the command line:

Call CTNLSUSR parm('xxxx')

Note: The 'xxxx' represents the value in the library Prefix name in the system attributes.



Step 3: From the following screen select the language of choice.



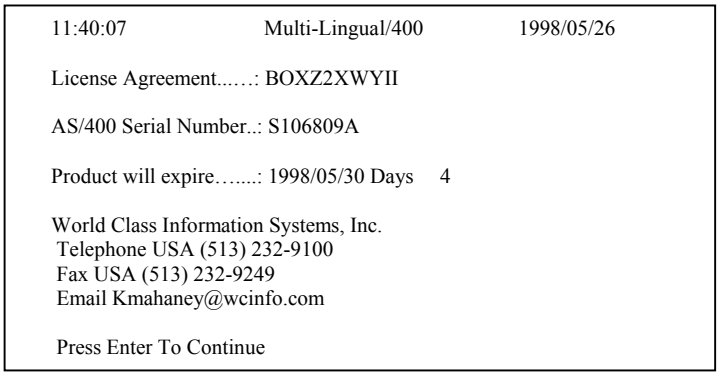
Chapter 22
License Agreement

The temporary license agreement will be displayed if the product is set to expire within 5 days.

To extend the license contact a sales representative at:

World Class Information Systems, Inc.
(513) 232-9100
email Kmahaney@wcinfo.com

The following screen will be displayed. To continue, press Enter.



Appendix A
Keyboard Types and Code Pages

The following table lists the keyboard types and code pages for each national language supported by the AS/400 system.

Language	KBDTYPE	EBCDIC Character Set	EBCDIC SBCS Code Page	EBCIDIC CCSID	IBM Personal Computer SBCS Code Page
Albanian	ALI	00697	00500	00500	00850
Arabic	CLB	00235	00420	00420	00864
Austria/German	AGB	00697	00273	00273	00437
Austria/German MNCS)	AGI	00697	00500	00500	00850
Belgian MNCS	BLI	00697	00500	00500	00850
Brazilian Portuguese	BRB	00697	00037	00037	00850
Bulgarian	BGB	01150	01025	01025	00915 AND 00855 (dual code page support)
Canadian French	CAB	00341	00260	65535	00863
Canadian French (MNCS)	CAI	00697	00500	00500	00850
Croatian	YGI	00959	00870	00870	00852
Cyrillic	CYB	00960	00880	00880	00855
Czech	CSB	00959	00870	00870	00852
Danish	DMB	00697	00277	00277	00850
Danish MNCS	DMI	00697	00500	00500	00850
Finnish/Swedish	FNB	00697	00278	00278	00850
Finnish/Swedish MNCS	FNI	00697	00500	00500	00850
French (Azerty)	FAB	00697	00297	00297	00437
French (Azerty) MNCS	FAI	00697	00500	00500	00850
French (Qwerty)	FQB	00697	00297	00297	00437
French (Qwerty) MNCS	FQI	00697	00500	00500	00850
Greek (See note 2)	GNB	00925	00875	00875	00869
Hebrew	NCB	00941	00424	00424	00862
Hungarian	HNB	00959	00870	00870	00852
Icelandic	ICB	00697	00871	00871	00850
Icelandic MNCS	ICI	00697	00500	00500	00850
International	INB	00697	00500	00500	00850
Farsi (Iran)	IRB	01219	01097	01097	01098
Italian	ITB	00697	00280	00280	00437
Italian MNCS	ITI	00697	00500	00500	00850
Japanese-English	JEB	00697	00281	65535	See note 1
Japanese-English MNCS	JEI	00697	00500	00500	See note 1
Japanese Kanji and Katakana	JKB	01172	00290	05026	See note 1

Language	KBDTYPE	EBCDIC Character Set	EBCDIC SBCS Code Page	EBCIDIC CCSID	IBM Personal Computer SBCS Code Page
Japanese Kanji and US English	JUB	00697	00037	See note 3	See note 1
Japanese Katakana	KAB	00332	00290	00290	See note 1
Japanese Latin Extended	JPB	01172	01027	01027	See note 1
Korean	KOB	01173	00833	00833	See note 1
Latin 2	ROB	00959	00870	00870	00852
Macedonian	MKB	01150	01025	01025	00915 and 00855 (dual code page support)
Dutch (Netherlands)	NEB	00697	00037	00037	00850
Dutch (Netherlands) MNCS	NEI	00697	00500	00500	00850
Norwegian	NWB	00697	00277	00277	00850
Norwegian MNCS	NWI	00697	00500	00500	00850
Polish	PLB	00959	00870	00870	00852
Portuguese	PRB	00697	00037	00037	00850
Portuguese MNCS	PRI	00697	00500	00500	00850
Romanian	RMB	00959	00870	00870	00852
Russian	RUB	01150	01025	01025	00868
Serbian, Cyrillic	SQB	01150	01025	01025	00915 and 00855 (dual code page support)
Serbian, Latin	YGI	00959	00870	00870	00852
Simplified Chinese	RCB	01174	00836	00836	00932
Slovakian	SKB	00959	00870	00870	00852
Slovenian	YGI	00959	00870	00870	00852
Spanish	SPB	00697	00284	00284	00850
Spanish MNCS	SPI	00697	00500	00500	00850
Spanish Speaking	SSB	00697	00284	00284	00437
Spanish Speaking MNCS	SSI	00697	00500	00500	00850
Swedish	SWB	00697	00278	00278	00437
Swedish MNCS	SWI	00697	00500	00500	00850
French (Switzerland) MNCS	SFI	00697	00500	00500	00850
German (Switzerland) MNCS	SGI	00697	00500	00500	00850
Thai	THB	01176	00838	00838	00874
Traditional Chinese	TAB	01175	00037	00937	See note 1
Turkish (Qwerty)	TKB	01152	01026	01026	00857
Turkish (F)	TRB	01152	01026	01026	00857
English (United Kingdom)	UKB	00697	00285	00285	00437
English (United Kingdom) MNCS	UKI	00697	00500	00500	00850
English (United States and Canada)	USB	00697	00037	00037	00437
English (United States and Canada) MNCS	USI	00697	00500	00500	00850

Notes:

1. There is no IBM personal computer SBCS code page associated with this KBDTYPE.
2. For DBDTYPE GKB, the EBCDIC code page is 00423 and the IBM Personal Computer SBCS Code page is 00851.
3. Recommend SBCS CCSID 00037.

Appendix B
Language Country Identifiers

Language identifiers are used by the OfficeVision/400 licensed program for text search services and the OS/400 licensed program for sort sequence support. Sort sequence support is for single-byte character set (SBCS) languages only.

Language Identifiers

Language Name	Language Id	Primary Using Country	OS/400 Sort Sequence	OV/400 Text Search Services
Afrikaans	AFR	South Africa	Yes	No
Albanian (Shqip)	SQI	Albania	Yes	No
Arabic (Arabi)	ARA	Arab Area	Yes	No
Byelorussian	BEL	Belarus	Yes	No
Bulgarian	BGR	Bulgaria	Yes	No
Catalan	CAT	Spain	Yes	Yes
Traditional Chinese (SBCS only)	CHT	Republic of China	Yes	No
Simplified Chinese (SBCS only)	CHS	People's Republic of China	Yes	No
Czech (Cwsky)	CSY	Czech Republic	Yes	No
Danish (Dansk)	DAN	Denmark	Yes	Yes
German (Deutsch)	DEU	Germany	Yes	Yes
Swiss German	DES	Switzerland	Yes	Yes
Greek (Ellinika)	ELL	Greece	Yes	Yes
Australian English	ENA	Australia	Yes	Yes
UK English	ENG	United Kingdom	Yes	Yes
US English	ENU	United States	Yes	Yes
English Upper Case	ENP	United States	Yes	Yes
Spanish (Espanol)	ESP	Spain	Yes	Yes
Farsi	FAR	Iran	Yes	No
Finnish (Suomi)	FIN	Finland	Yes	Yes
French (Francais)	FRA	France	Yes	Yes
Belgian French	FRB	Belgium	Yes	Yes
Canadian French	FRC	Canada	Yes	Yes

Language Identifiers

Language Name	Language Id	Primary Using Country	OS/400 Sort Sequence	OV/400 Text Search Services
Swiss French	FRS	Switzerland	Yes	Yes
Irish Gaelic	GAE	Ireland	Yes	No
Hebrew (Ivrith)	HEB	Israel	Yes	No
Croatian	HRV	Croatia	Yes	No
Hungarian	HUN	Hungary	Yes	No
Icelandic	ISL	Iceland	Yes	Yes
Italian	ITA	Italy	Yes	Yes
Swiss Italian	ITS	Switzerland	Yes	Yes
Japanese Katakana	JPN	Japan	Yes (SBCS only)	Yes (SBCS only)
Korean	KOR	Korea, Republic of	Yes (SBCS only)	No
Macedonian	MKD	Former Republic of Yugoslavia Macedonia	Yes	No
Dutch	NLD	Netherlands	Yes	Yes
Belgian Dutch	NLB	Belgium	Yes	Yes
Norwegian	NOR	Norway	Yes	Yes
Polish	PLK	Poland	Yes	No
Portuguese	PTG	Portugal	Yes	Yes
Brazillian Portuguese	PTB	Brazil	Yes	Yes
Rhaeto-Romanic	RMS	Switzerland	Yes	No
Romanian	ROM	Romania	Yes	No
Russian	RUS	Russia	Yes	No
Slovakian	SKY	Slovakia	Yes	No
Slovenian	SLO	Slovenia	Yes	No
Serbian (Latin)	SRL	Countries of the former Yugoslavia	Yes	No
Serbian (Cyrillic)	SRB	Countries of the former Yugoslavia	Yes	Yes
Swedish	SVE	Sweden	Yes	Yes
Thai	THA	Thailand	Yes	No
Turkish	TRK	Turkey	Yes	Yes

Country Identifiers

Country Name	Country Identifier
Afghanistan	AF
Albania	AL
Algeria	DZ
American Somoa	AS
Andorra	AD
Angola	AO
Anguilla	AI
Antarctica	AQ
Antiqua and Barbuda	AG
Arabic speaking countries	AA
Argentina	AR
Armenia	AM
Aruba	AW
Australia	AU
Austria	AT
Azerbaijan	AZ
Bahamas	BS
Bahrain	BH
Bangladesh	BD
Barbados	BB
Belarus	BY
Belgium	BE
Belize	BZ
Benin	BJ
Bermuda	BM
Bhutan	BT
Bolivia	BO
Bosnia/Herzegovina	BA
Botswana	BW
Bouvet Island	BV
Brazil	BR
British Indian Ocean Territory	IO
Brunei Darussalam	BN
Bulgaria	BG
Burkina Faso	BF
Burundi	BI
Burma	BU
Cambodia	KH
Cameroon, United Republic of	CM
Canada	CA
Cape Verde	CV
Cayman Islands	KY
Central African Republic	CF
Chad	TD
Chile	CL
China	CN
Christmas Island	CX
Cocos (Keeling) Island	CC
Colombia	CO
Comoros	KM

Country Identifiers

Country Name	Country Identifier
Congo	CG
Cook Islands	CK
Costa Rica	CR
Ivory Coast	CI
Croatia	HR
Cuba	CU
Cyprus	CY
Czech Republic	CZ
Denmark	DK
Djibouti	DJ
Dominica	DM
Dominican Republic	DO
East Timor	TP
Ecuador	EC
Egypt	EG
El Salvador	SV
Equatorial Guinea	GQ
Estonia	EE
Ethiopia	ET
Falkland Islands	FK
Faroe Islands	FO
Fiji	FJ
Finland	FI
France	FR
French Guiana	GF
French Southern Territories	TF
French Polynesia	PF
Gabon	GA
Gambia	GM
Georgia	GE
Germany	DE
Ghana	GH
Gibraltar	GI
Greece	GR
Greenland	GL
Grenada	GD
Guadeloupe	GP
Guam	GU
Guatemala	GT
Guinea	GN
Guinea-Bissau	GW
Guyana	GY
Haiti	HT
Heard and McDonald Islands	HM
Honduras	HN
Hong Kong	HK
Hungary	HU
Iceland	IS
India	IN

Country Identifiers

Country Name	Country Identifier
Indonesia	ID
Iran (Islamic Republic of)	IR
Iraq	IQ
Ireland	IE
Israel	IL
Italy	IT
Jamaica	JM
Japan	JP
Jordan	JO
Kazakhstan	KK
Kenya	KE
Kiribati	KI
Korea, Democratic People's Republic of	KP
Korea, Republic of Kuwait	KR
Kyrgyzstan	KG
Lao People's Democratic Republic	LA
Latvia	LV
Lebanon	LB
Lesotho	LS
Liberia	LR
Libyan Arab Jamahiriya	LY
Liechtenstein	LI
Lithuania	LT
Luxembourg	LU
Macau	MO
Macedonia	MK
Madagascar	MG
Malawi	MW
Malaysia	MY
Maldives	MV
Mali	ML
Malta	MT
Marshall Islands	MH
Martinique	MQ
Mauritania	MR
Mauritius	MU
Mexico	MX
Micronesia	FM
Moldava, Republic of	MD
Monaco	MC
Mongolia	MN
Montenegro	ME
Montserrat	MS
Morocco	MA
Mozambique	MZ
Myanmar	MM
Namibia	NA
Nauru	NR
Nepal	NP
Netherlands	NL

Country Identifiers

Country Name	Country Identifier
Netherlands Antilles	AN
New Caledonia	NC
Neutral Zone	NT
New Zealand	NZ
Nicaragua	NI
Niger	NE
Nigeria	NG
Niue	NU
Norfolk Island	NF
Northern Mariana Islands	MP
Norway	NO
Oman	OM
Pakistan	PK
Palau	PW
Panama	PA
Papua new Guinea	PG
Paraguay	PY
Peru	PE
Philippines	PH
Pitcairn	PN
Poland	PL
Portugal	PT
Puerto Rico	PR
Qatar	QA
Reunion	RE
Romania	RO
Russia	RU
Rwanda	RW
Saint. Helena	SH
Saint Kitts and Nevis	KN
Saint Lucia	LC
Saint Pierre and Miquelon	PM
Saint Vincent and the Grenadines	VC
Western Samoa	WS
San Marino	SM
Sao Tome and Principle	ST
Saudi Arabia	SA
Senegal	SN
Seychelles	SC
Sierra Leone	SL
Serbia	SQ
Singapore	SG
Slovakia	SK
Slovenia	SI
Solomon Islands	SB
Somalia	SO
South Africa	ZA
Spain	ES

Country Identifiers

Country Name	Country Identifier
Sri Lanka	LK
Sudan	SD
Suriname	SR
Svalbard and Jan Mayen Islands	SJ
Swaziland	SZ
Sweden	SE
Switzerland	CH
Syrian Arab Republic	SY
Taiwan	TW
Tajikistan	TJ
Tanzania, United Republic of	TZ
Thailand	TH
Togo	TG
Tokelau	TK
Tonga	TO
Trinidad and Tobago	TT
Tunisia	TN
Turkmenistan	TM
Turkey	TR
Turks and Caicos Islands	TC
Tuvalu	TV
Uganda	UG
Ukraine	UA
United Arab Emirates	AE
United Kingdon	GB
United States Minor Outlying Islands	UM
United States of America	US
Uruguay	UY
Uzbekistan	UZ
Vanuatu	VU
Vatican City State	VA
Venezuela	VE
Vietnam	VN
Virgin Islands (British)	VG
Virgin Islands (U.S.)	VI
Wallis and Futuna Islands	WF
Western Sahara	EH
Yemen, Republic of	YE
Countires of the former Yugoslavia	YU
Zaire	ZR
Zambia	ZM
Zimbabwe	ZW

Appendix C
Coded Character Set Identifiers (CCSIDs)

This appendix shows the encoding schemes, the character set, and the code page for coded character set identifiers (CCSIDs) on the AS/400 system.

Encoding Scheme Identifier	Encoding Scheme	Interpretation
1100	EBCDIC single-byte	Single-byte, no code extension is allowed.
1200	EBCDIC double-byte	Double-byte, no code extension is allowed.
1301	EBCDIC mixed-byte	Mixed single-byte and double -byte, using the shift-out (SO) and shift-in (SI) method.
2100	IBM-PC Data single-byte	Single-byte, no code extension is allowed.
2200	IBM-PC Data double-byte	Double-byte, no code extension is allowed.
2300	IBM-PC Data mixed-byte	Mixed single-byte and double-byte, no (explicit) code extension.
4100	IS0 8 single-byte	Single-byte, no code extension is allowed.
4403	Japanese EUC, Traditional Chinese EUC, and Korean on ISO2022 multi-byte	Mixed-byte.
5100	Japanese, Traditional Chinese, and Korean EUC single-byte	Single-byte.
5404	Japanese EUC and TCP/IP; Traditional Chinese EUC on 7-bit ISO-2022; traditional Chinese TCP/IP OS/400; ISO 2022 TCP/IP OS/400; Korean EUC on 7-bit ISO-2022	Double-byte.
7200	ISO 10646 Universal Character Set level 2 multi-byte	Multi-byte.